SPECULATION AND FUTURES TRADING IN COMMODITIES : A SURVEY

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CERTIFICATE

This is to certify that the dissertation entitled "SPECULATION AND FUTURES TRADING IN COMMODITIES : A SURVEY", submitted by Arindam Ray, in partial fulfilment of the requirements for the award of the degree of MASTER OF PHILOSOPHY (M.Phil.) of this University, is his original work and has not been submitted for the award of any other degree of this University or of any other University.

We recommend that this dissertation be placed before the examiners for evaluation.

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To

My Beloved Parents

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INTRODUCTION

There is a long tradition of futures trading in India going back, in the case of some commodities, to over a hundred years. However, futures trading in a well organised form seems to have developed as a consequence of large scale fluctuations in prices experienced after the First World War.

Cotton, perhaps being an exportable commodity, seems to have attracted futures trading in an unorganised form well before 1875. A representative association called the East India Cotton Association was formed in 1921 to organise such trading in cotton on proper lines. This was perhaps the first futures trading association in India with a comprehensive constitution and by-laws providing for all details. Other commodities in which futures trading has traditionally been conducted for a long time include oilseeds, raw jute and jute goods, spices like pepper and turmeric and bullion.

During the early years of World War II, the prices of various commodities rose to high levels as a result of acute shortages and the Government of India issued orders under the Defence of India Rules prohibiting futures trading in most of the commodities like foodgrains, cotton, edible oilseeds and oils, jute goods, etc. With the cessation of hostilities, there was an increasing demand for removal of ban on futures trading in various commodities. However, the general consensus was that futures trading in important commodities should be permitted only under governmental regulation in public interest.

The first comprehensive measure for the purpose of continuous regulation was taken in the erstwhile Bombay State in 1947, when the Bombay Forward Contracts Control Act was enacted. The Act was a permissive one and applied to cotton, oilseeds and bullion in the city of Bombay. It vested certain regulatory powers in the State government but did not set up any independent body specifically for exercising them. After independence, stock exchanges and futures markets were included in the Union List of powers under the new constitution and it was decided to undertake Central legislation on the subject. In February 1950, the Futures

Markets (Regulation) Bill was drafted and referred to an Expert Committee under the Chairmanship of Shri A.D.Shroff, which suggested various modifications. The basic approach of the Expert Committee in regard to forward trading has been clearly set out in the following:

" To start with, there are certain general propositions which must be agreed upon before any scheme for regulating forward markets could at all be considered. Forward trading involves speculation about the future, but not all forms of forward trading could be considered as either unnecessary or undesirable for the efficient functioning of anything but the most primitive economy. With the development of international communications, it has become virtually impossible in normal times for any of the principal commodity markets of the world to function in isolation from the rest at any rate in respect of those commodities which constitute the staple lines of world commerce. The price system is not merely subject to world influences, but also to influences emanating from unforeseen variations in demand and supply over a period of time. It is an inevitable characteristic of modern industrial civilisation that it involves a lengthening of the process of production, and this increases the risks inherent in any productive enterprise. Most persons engaged in productive enterprises have frequently 'to take a view of the market'. The same applies to persons engaged in purely trading activities. To the extent to which forward trading enables producers, manufacturers and traders to protect themselves against the uncertainties of the future, and enables all the relevant factors, whether actual or anticipated, local or international, to exercise their due influence on prices, it confers a definite boon on the community, because, to that extent, it minimises the risks of production and distribution and makes for greater stability of prices and supplies. It must be recognised, therefore, that forward trading plays a useful role in modern business. At the same time, it must be admitted that this is an activity in which a great many individuals with small means and inadequate knowledge of the market often participate in the hope of quick or easy gains, and consequently, forward trading often assumes unhealthy dimensions, thereby increasing, instead of minimising, the risks of business. There are forms of forward trading, for example, options, which facilitate participation by persons with small means and inadequate knowledge. In

conditions of shortage and surplus, prices may assume only a one-way trend, and forward trading may accentuate such trends to the serious detriment of the interests of the community. It is, therefore, necessary to eliminate certain forms of forward trading, and permit others under carefully regulated conditions, in order to ensure that, while producers, manufacturers and traders will have the facilities they need for the satisfactory conduct of their business, the wider interest of the community, and particularly, the interests of consumers, will be adequately safeguarded against any abuse of such facilities of others."

After the FC(R) Act was passed and Forward Markets Commission was set up in 1953, futures trading was permitted in a number of agricultural commodities like cotton, kapas (unginned cotton), raw jute and jute goods, edible oil complex like oilseeds and oil including groundnut and castor, spices and bullion.

In the mid-sixties with the monsoon playing truant, agricultural production of many commodities fell and prices rose in response to this situation. On the understanding that speculation in futures would contribute to further price volatility, futures trading was banned in a number of commodities and severely restricted to a few others like castor seeds, spices, jute etc.

Consequently, although the Dantawala and Khusro Committees (which were set up after the ban in futures trading) recommended resumption of futures trading, our Government was not yet prepared to resume futures trading. The recent Committee report headed by Prof. Kabra was submitted in 1994 and had also recommended resumption of futures trading in as many as 17 commodities. The Government decision on the report is still awaited.

Meanwhile, not only futures trading but even trading in forward contracts (including non transferable specific delivery) continue to remain prohibited in most commodities and their product under the FC(R) Act. At present, futures trading is permitted in only six commodities, namely castorseed, gur, turmeric, pepper, potatoes and hessian. Due to stringent regulatory measures, like special margins beyond or below specified price levels, limits on open interests, etc., liquidity in such futures trading is severely restricted.

In an economic order, marked with increasing volatility in commodity prices, it is imperative for the agents involved in the commodities to avail some price risk management (P.R.M) instruments whereby they can hedge their risks arising out of the adverse fluctuations in prices. It is against such a backdrop, that this paper, in a very simplified approach tries to demystify the relevance of futures trading. Such a task has been done by dividing this paper into five chapters.

The first chapter deals with the economics behind futures trading i.e., the interaction of hedging and speculation which takes place at tandem. We try to distinguish between forward and futures contract and thus establish the comparative advantage of the latter. Next we make an in depth study on how effective hedging is and what are the conditions for hedging practices to be successful. Related to the hedgers, there surfaces a group of operators called the speculators, who assume the risk transferred by the hedgers. Speculation in futures trading is the main fulcrum around which this paper proceeds. We ask a number of questions about speculation : who are the speculators, what are the determinants of the volume of speculation, is speculation a social evil and whether speculation destabilises prices in the spot market. Another trading activity, which usually hurt agents dealing in commodities is manipulation. The line of distinction between manipulation and speculation is accordingly shown. Finally, we make a study of the conditions for efficiency of a futures market.

In the next chapter, we cite some empirical evidences about futures trading in commodities from the international market. We address four main issues : a comparative analysis of futures trading in commodities *vis-à-vis* other stabilisation programmes, how efficient the commodity futures markets are, the speculative effects of futures trading on commodity prices and manipulative exercises.

Chapter three deals with a survey on the Indian experience of futures trading in commodities. Since futures trading in the major commodities like groundnut, cotton and jute, in an organised form, was in existence only for a brief period (ranging from 1953 to 1966), we take it as our reference period to evaluate the

performance of futures markets in India.[1] Further more, limited studies and the lack of relevant data in futures trading in such commodities also makes it difficult to carry out any quantitative analysis. Thus, it is more of a qualitative analysis that has been undertaken to evaluate the effectiveness of hedging and the price effects of speculation in the Indian futures markets. Finally, we make two commodity specific analysis of futures trading in cotton and groundnut. Such an analysis has been undertaken since with the pressure mounting on the Government to resume futures trading on major commodities like cotton, edible oil complex, it is imperative for us to have an understanding of commodity specific attributes of futures trading.

Chapter four evaluates the present scenario of cotton and groundnut. Variables like spot prices, production, yield and proportion of area under irrigation have been used to give a proper perspective of the need for a hedging instrument like futures trading in these commodities.

Finally, in chapter five we make an assessment of the issues discussed in the previous chapters. We thus conclude how effectively futures trading serves as a hedging instrument; what are the costs associated with it; how far speculation is essential for futures trading, its influences on price instability; manipulation and finally the commodities fit for futures trading in India.

[1] Although futures trading is now allowed in six commodities (castorseed, gur, turmeric, pepper, potato and hessian), the low volume of trading turnover in such commodities due to stringent regulatory measures makes it prudent on our part to compartmentalise our selection of the period (i.e., between the decades of fifties and sixties and that later on) and commodities (i.e., between commodities like groundnut and cotton and those mentioned above) in the history of futures trading in India.

CHAPTER : I

FUTURES TRADING

Futures trading is a very sophisticated mechanism which assists in the marketing of commodities. Its principal function is to enable the trading interests to shift the risk involved in such activities, arising out of the adverse price fluctuations, to those who are willing to assume it in the hope of making some profit. Futures trading which serves to lock in prices has been defined by Working as "trading conducted under special regulations and conventions, more restrictive than those applied to any other class of commodity transactions, which serves primarily to facilitate hedging and speculation by promoting exceptional convenience and the economy of transactions".[1]

It is necessary to distinguish between futures or a hedge contract and other types of ***forward contracts***. In any society which has to make arrangements for a constant supply of a commodity, trading activity cannot be confined to the immediate present needs. A manufacturer or a processor has to ensure in advance that he would get his supplies of raw material at the appropriate time and this he may do by entering into a purchase contract with a trader. The trader may, in turn, enter into a similar contract with a producer much in advance of the actual production or harvesting of the commodity. These 'forward contracts', sometimes also called '*time contracts*',[2] are contracts for giving and taking actual delivery of goods at a specified price and at a specified future date. The use of these contracts has preceded the development of futures trading.

I) FUTURES Vs FORWARD TRADING :

Forward trading provides a mechanism for reducing price variability in that both parties can agree a price in advance and guarantee that price for a set quantity of

[1] Holbrook Working, "Futures Trading and Hedging", *American Economic Review*, Vol. 13, 1953.
[2] For more details on forward contracts refer Annexure I.

the commodity. Such contracts, however, also have a number of limitations. Forward markets are not organised in any way and trading can take place at any time and any place, thus both parties will incur costs associated with searching for a suitable trading partner and forming an agreement on price. As a direct result of the lack of organisation, quality levels will vary across contracts. In addition, as the trade is in the physical commodity, direct inspection of the commodity is necessary if trade is to take place, which is time consuming and costly. Price levels will be uncertain as there is no uniformity in the way individuals bargain, which means that the market is limited in its ability to disseminate information to traders. As there is no centralised market or exchange where the contracts are drawn up, there is no mechanism to ensure that the contract is delivered at the time specified, resulting in possible litigation and lack of trust. There may be an imbalance in the number of buyers and sellers, representing the possible frustration of aspirations and a waste of resources in fruitless searches for contracts. Finally, the lack of price discovery which is always a feature of forward markets, means that speculators are effectively excluded from the market, thus causing problem of liquidity.

Futures trading provides an alternative mechanism for managing the variability and risk associated with producing and trading commodities. In very simple terms, futures trading is an organised and highly liquid form of trading in forward contracts. As such, it offers users the benefits associated with forward pricing without the constraints implied by the need to make a physical transfer of the commodity. The need for futures markets can be questioned when forward contracts can play a similar role. Telser[1] suggests that although the reduction of risk can be achieved by the use of forward contracts, these are less flexible and fungible than futures contracts which may make them less attractive to non-commodity traders (i.e. insurers). The liquidity of the futures market and its standardised contract make it a highly fungible market.[2] As a result of its liquidity, it can be suggested that the

[1] L. G. Telser, "Why are there Organized Futures Markets", *Journal of Law and Economics*, Vol. 24, 1981.

[2] For conditions of liquidity in futures markets and its implications refer Annexure II.

ability of futures trading to offer a convenience yield[1] is as important if not more than its risk management features.

Nevertheless, the risk-reducing opportunities provided through futures trading mean that such mechanisms are increasingly being seen as a means of providing the individual grower or trader with the opportunity to reduce the price variability they face in the absence of more formalised system of market interventions. The ability of futures markets to reduce the risks associated with price variability and stock holding through hedging is probably their most widely recognised role.

Stoll and Whaley brings forth another aspect of distinction between these two contracts : "Futures contracts require daily settlement of profits and losses. A forward contract is identical to a futures contract in all respects, except that with a forward contract, profits and losses are realised only at maturity or when the forward position is reversed. Thus, it is possible for the buyer of a futures contract to suffer short-term losses (due to decline in the futures price) even if the contract is not liquidated, while the buyer of a forward contract would not incur those same losses unless he liquidates his forward contract position. The difference between futures and forward contracts lies in the fact that gains (losses) can be invested (borrowed) at the short-term interest rate, while gains or losses on forward contracts are not recognised until the contract matures or is liquidated. At maturity, the futures and forward contracts have claims on the same amount of the commodity, so that the difference between these contracts have to do with the timing of gains and losses."[2]

The difference in the pattern of cash flows of the forward and futures positions means that the value of a forward contract position is slightly different from the value of a futures contract position. However, if the short-term interest rates are constant, the price of a forward contract equals the price of the futures contract. The difference between the value of a futures position and a forward position is reflected in a difference between the futures and forward prices.

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[1] Convenience yield arises from the 'possession' of a commodity, and consists of making use of the commodity (for further processing or sale), the moment it is needed.

[2] Hans R. Stoll and Robert E. Whaley, "*Futures and Options : Theory and Applications*", South Western Publishing Co., Ohio, 1993.

II) FUTURES CONTRACT :

When 'forward contracts' become a part of the normal marketing process, the development of what are called *'futures'* or *'hedge'* contracts became an economic necessity, provided the commodities concerned have the requisite characteristics[1] to facilitate such trading in them smoothly. A ***futures contract*** is a contract to buy or sell an underlying commodity at a future time, at a price specified today. In other words, it is a countervailing contract transacted in a futures market through which those who have bought in the ready market will sell in the futures market and those who have sold in the ready market would buy in the futures market. In each of these two cases, a purchase(sale) in the ready market is off-set by an opposite sale(purchase) in the futures market. When the purchase or sale commitment in the ready market is fulfilled, the sale or purchase hedge contract is closed out by an offsetting reverse purchase or sale contract in the futures market. Thus, a favourable movement in the futures(spot) price is offset by an opposite movement in the spot(futures) price.

Payment for the underlying commodity is not made unless, and until, delivery of the underlying commodity is taken. In organised futures markets, contracts can be *reversed* before expiration (i.e. not held till maturity) by taking a position of opposite sign but equal magnitude in the same futures contract. In practice most futures contracts are not settled by delivery of the commodity. Rather, an evening out process takes place whereby buyers sell their contracts and sellers buy back contracts at different times and with different parties. Most futures contracts are, in fact, reversed prior to expiration. Futures contracts are a means for reducing risk or assuming risk in the hope of profit, not a means of taking possession of the underlying commodity. While actual delivery of goods can be given against the futures contract, usually the contract is not used for giving or taking delivery as it is primarily meant for providing insurance against price fluctuations. Deliveries take

[1] Refer Chapter IV for a detailed discussion on requisite characteristics of commodities for futures trading.

place only in a 'residual' sense in respect of the outstanding contracts which are not off-set by corresponding opposite transactions.

Further, the standardised contract terms[1] discourages users of physical commodities from accepting delivery. The contract specifications often do not coincide with the precise needs of commercial users in terms of timing, location, quality or quantity. Consequently, maturing futures contracts are either replaced with a more distant one (***roll over***) or are closed (***off-set***) and the physical commodities corresponding to the actual commercial user's needs in terms of timing, location, quality and quantity are acquired elsewhere (e.g. spot or forward markets). At any point in time, the difference between the number of open commodity contracts held in an account is termed ***net long*** if futures purchases exceed sales and ***net short*** if sales exceed purchases. The residual delivery takes place only when a futures trader may hold open positions to take delivery of commodities (*long position*) or to make delivery of commodities (*short position*).

The parties to the original contract can be relieved of their obligations with ease, as the associations organising futures trading facilities maintain a clearing house, somewhat similar to that maintained for settlement among banks, to keep track of the long and short futures position and to determine who are parties to contracts at any given time. Since futures are 'created' instruments, the number of such contracts that are created is not limited to the number of shares that the firm has issued. ***Open interest*** is the number of futures contracts outstanding at any one time. The clearing house is critical to the trading of futures contracts because it settles and guarantees the contracts. After a contract is agreed to, the clearing house interposes itself between the buyer and the seller and, in effect, becomes the party to whom delivery is made and from whom delivery is taken. Since the number of buyers always equal the number of sellers, the clearing house always has a zero net position.

The clearing house of a futures association recognises only members as principals. It does not deal directly with clients or non-members. The association requires every member to report to its clearing house all purchases and sales every

[1] Refer Annexure III for details on contract design.

day or at the end of a week (depending on whether the clearing is daily or weekly). The clearing house collects amounts payable by the members in respect of their outstanding trading position on the basis of the extent to which the price of the concerned futures contract has moved against them and pays the amount to the members in whose favour the price has moved. This clearing house procedure[1] prevents accumulation of any large scale financial risk and facilitates liquidation of outstanding position by members without any financial risk to the opposite parties involved.

Every futures contract entered into has two sides : a willing buyer and a willing seller. If one side of the contract makes a profit, the other side must make a loss. All futures markets participants taken together can neither lose nor gain --- the futures market is a zero-sum game.

The futures contract was evolved to enable the various functionaries, engaged in merchandising a commodity or its processed products, such as dealers, stockists, commission agents, processors, etc., to hedge i.e. to protect themselves against the risk of unpredictable price fluctuations over time in the commodity. All these functionaries, dealing in the commodity have to store and carry forward stocks[2] of the commodity either in its raw or processed form over time in the course of which they are exposed to the possibility of an unforeseen price fluctuations, which may cause them huge losses. In other words, the risk of price fluctuation is speculative in nature. Many businessmen dealing in commodities, therefore, desire to segregate the speculative element from business by passing it on to others who are willing to shoulder it in the hope of making a profit. This segregation is achieved by 'hedging operations' in a futures market.

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[1] Refer Annexure IV for the clearing house mechanism.

[2] Stocks of many commodities need to be carried forward over time, for various reasons. First, certain commodities take shape of final consumers' goods only after lengthy manufacturing processes. Secondly, certain commodities, particularly agricultural commodities, cannot be produced continuously and have to be stocked because the total supply cannot be consumed immediately. Thirdly, the supply of such discontinuously produced commodities cannot be precisely adjusted to demand, being generally governed by natural conditions beyond human control, such as rains, general weather conditions, etc., and these commodities have to be stocked to meet future uncertainties. Fourthly, even the commodities that can be continuously produced, have to be stocked because it is not economical to vary the rate of output in accordance with uncertain variations in demand.

III) HEDGING :

Hedging is a form of insurance. The practice of hedging is based on the assumptions that (i) the ready and the futures prices of the commodity will move (i.e., advance or decline) together and (ii) the *spread* (difference between the price of the commodity in the ready market and the price prevailing in the futures market) and between prices of different futures contracts running concurrently will remain relatively stable. This is a tendency rather than a rule upon which hedgers can generally depend. The ready price and the futures prices of different futures contracts of the season ordinarily do move together in sympathy with each other because both ready and future prices have to respond to the same basic demand and supply factors since (i) futures contracts can be converted into the actual commodity by taking or giving delivery of goods if either the buyer or the seller so desires and (ii)experienced traders constantly watch the relationship between ready and futures prices for arbitrage[1] transactions.

In certain circumstances, the ready and futures prices may not move together. Moreover, sometimes the spread between the two may increase or decrease sharply. To the extent they do not move together by the same extent, hedging itself might be a source of minor gains or losses. However, by and large, hedging does afford adequate protection to the various functionaries. Such risk transfer by hedgers takes place by parting with a share of their surpluses (net profits) since the risk takers, essentially speculators, must be assured of a rate of return (not necessarily normal rate of return which should exist under perfect conditions) as a compensation for bearing the risk. Such returns to the risk bearers can be justified on the ground that they also have to invest capital to take a position in the futures market opposite to the risk averter. It is this risk factor which conceptually separates a hedger (i.e. risk averter) from a speculator (i.e. risk taker). In the process, the rate of return is the

[1] Arbitrageurs are operators who simultaneously purchase in one market at a lower price and sell in another at a higher price.

crucial factor which pushes the futures market and thereby injects liquidity in the transactions.

The aim of hedging is risk reduction. It involves commitments of opposite transactions in the related spot (actuals) and futures markets. Thus : (i) A trader who acquires an unsold stock (say) of castorseed, *hedges it by selling* castorseed *futures.* He is ***'long' in spot*** (actuals) and ***'short' in futures*** and is called a ***short hedger.*** (ii) An oil miller who sells castor oil to an exporter for actual delivery at some future date (ntsd contract) and does not have a stock of castorseed, may *hedge* his forward (delivery) commitment in the actual castor oil by buying castorseed futures. He is ***'short' in spot*** (actuals) and ***'long' in futures*** and is called a ***long hedger.***

In each of these two cases, an open position in the spot market is "off-set" by an opposite position in the futures market and when the open position in spot is terminated, the hedge is closed out by a reverse (offsetting) transaction in futures. The volume of short(long) hedging tends to be large when stocks in commercial hands are large(small) and when the ready price is below(above) the futures price; a reversal in this situation brings a decline. Short hedging has a marked seasonal pattern, reaching a peak when commercial stocks are largest and the spread is favourable and then declining as the season advances. The seasonal pattern is less marked in long hedging. Generally there is an excess of short over long hedging during the bulk of the crop year.

Someone who buys/sells futures takes a ***long/short position*** and gains to the extent the futures price at which that position is reversed (the terminal futures price) is above/below the initial futures price. Thus if a buyer anticipates that the price of castorseed is likely to go up/decline in the future, he takes a long/short position in the futures market and buys/sells futures. The profit from a long futures position initiated at price F_0 is plotted in Figure 1.1. For every rupee price rise(decline) above(below) F_0, the investor makes(loses) one rupee. Likewise, the profit from a short position initiated at the futures price, F_0, is shown in Figure 1.2. For every rupee price rise(decline) above(below) F_0, he loses(makes) one rupee.

FIGURE 1.1. Profit Diagram for Long Futures Position Held to Expiration.

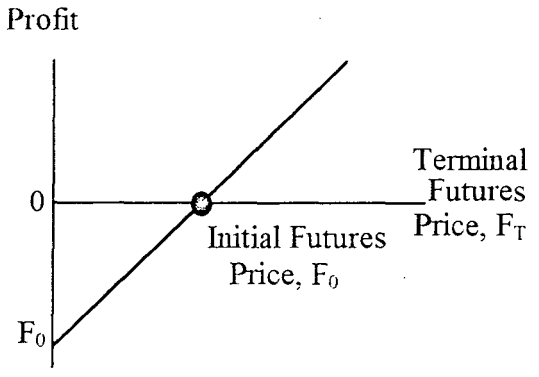
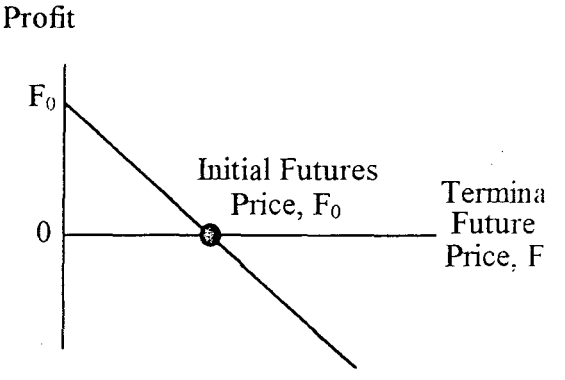


FIGURE 1.2. Profit Diagram for Short Futures Position Held to Expiration.



Though the avoidance of price risks is normally considered as the motivation for hedging, Working has made some finer distinctions between different types of hedging and as a consequence, by and large, the following types of hedging are recognised in the recent literature.

Routine Hedging : This type of hedging relates to the hedging of price risks as explained above, which involves the routine covering of traders' position in actuals by entering into equivalent off-setting transactions in futures. This type of routine hedging is accepted as a standard practice. Routine (short) hedging is attractive to a trader, processor, or manufacturer whose main business activities require the holding of stocks, but who is unwilling to trust his judgement upon prospective price movement.

Selective or Discretionary Hedging : This type of hedging is distinguished from routine hedging, by the exercise of judgement about price changes by the trader. A selective short hedger is one who practices hedging only when he strongly expects a fall or rise in the prices. On other occasions, he speculates with his stocks. His decision to hedge the whole or part of his stocks depends upon his confidence in his

own judgement regarding future course of prices, his financial resources and his ability to withstand losses.

Arbitrage or Carrying Charge Hedging : The third type of hedging called 'arbitrage' hedging is practised to take advantage of expected favourable changes in the spread between the ready and futures prices or between the prices of the different futures contracts, whereas the first two (routine and selective) types of hedging are carried out in response to the uncertainties in price changes.

Anticipatory Hedging : In this case, the sale or purchase of futures contracts is made before the actual commitment are entered into. To quote Working, : "Anticipatory hedging.....differs from selective hedging in that the hedging contract is not matched by either an equivalent stock of goods or a formal merchandising commitment that it may be said to offset. It takes either of two principal forms : (i) purchase contracts in futures acquired by processors (or manufacturers) to cover raw material 'requirements' or (ii) sales contracts in futures by producers, made in advance of the completion of production. In either of these forms the anticipatory hedge serves as a temporary substitute for merchandising contract that will be made later"[1]. However, since there is no certainty or near certainty between the future and actual transactions, this use of futures market, though may prove beneficial to the party concerned, has to be treated on par with speculation, as till the actual commitment is made, the distinction between the so called anticipatory hedge contract and speculative contract is merely in the motives of the operator.

In fact Kamara[2] suggests that pure risk avoidance hedging is not a goal of trading on modern futures markets as hedging is motivated by a desire to stabilise income and partially increase profit, thus introducing an element of speculation into any trading strategy. In effect, futures trading can be viewed as speculation on the movement in the basis which should be less variable than either the spot or futures price alone.

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[1] H. Working, "New Concepts Concerning Futures Markets and Prices", *The Journal of American Economic Association*, June 1962.

[2] A Kamara, "Issues in Futures Markets", *Journal of Futures Markets*, Vol. 2, 1982.

From Working's classification of hedges, it appears that the factors which influence the decision of most businessmen to hedge are essentially three, viz. price expectations, relation between ready and futures prices and degree of the risk-aversion of the businessman. These three determinants are not mutually exclusive, for they together influence the decision whether to hedge or not. Hedging decisions are based on careful assessment of costs and risks of hedging and anticipated returns therefrom. Hedging costs comprising brokerage and other transactions costs, however, are small. The expected hedging risks and returns therefore play a very crucial role in most hedging decisions.

The analysis of expected returns from short and long hedging under different conditions of ready-futures price behaviour discloses two important determinants of hedging use of a futures market. These are : (i) There should exist a high degree of positive correlation between changes in ready prices and changes in futures prices so that price risks of both long and short hedgers are offset or reduced by hedging. The higher the correlation, the more unbiased is the futures market for long and short hedging. A lower correlation, on the other hand, introduces an element of bias in favour of one or the other class of hedgers. Thus, when the ready price rises relative to the futures price, short hedgers increase their positive returns from hedging while long hedgers earn less. Conversely, when the futures prices rise relative to the ready price, long hedgers earn more from hedging than short hedgers. The bias against the one or the other type of hedging, however, is complete when the price movements in the two markets are reverse, that is, when the correlation between changes in ready prices and changes in futures prices is negative. Thus, when ready price rises and futures price falls, short hedgers earn profits in both the ready and futures markets while long hedgers lose. At the other extreme, when ready price declines and futures price advances, long hedgers gain both in the ready and futures markets but short hedgers lose. (ii) The ready-futures price relationship at the time of placing the hedge measures the nature and magnitude of the 'basis' risk as well as the bias of the futures market in favour of one or the other class of hedgers. Short hedging is encouraged if ready price is below the futures price, and discouraged if the ready price is above the futures price. Conversely, long hedging is encouraged when the

futures price is at a discount, but discouraged when it is at a premium.[1]

The second determinant is therefore by far the most important between these two, and determines both the type and actual volume of hedging activity on any futures market. But, it is the first one that essentially measures, ex post, the effectiveness of hedging and the bias of the futures market. Hence, it alone really determines the economic efficiency of hedging.

According to Working, the relationship between futures and spot markets depends on : "If a substantial number of these people are using the futures market for hedging, and therefore make decisions concerning spot transactions partly on the basis of futures prices, the future prices have a substantial influence on 'spot' prices."[2] The larger the hedging use, the higher will be the association between movements in ready and futures prices. To put it differently, the extent or the degree of such associations may be regarded as largely an appropriate index of both the actual hedging use of the futures market as well as its effectiveness for such use.

There are two other reasons which ensure close relationship between ready and futures prices. One is the option given by the futures trading associations to the sellers to issue delivery orders against the futures contracts during the delivery period. This right ensures that ready and futures prices rule almost at par with one another during the delivery period, while in the pre-delivery months their relationship is influenced by the costs of carrying goods till the maturity of the futures contract. True, the deviations from the expected theoretical relationship are not infrequent; but these are continuously sought to be corrected through appropriate arbitrage transactions between the ready and futures markets. Secondly, the governing bodies of commodity exchanges fix due rates for settlement of all outstanding futures

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[1] These two determinants are not mutually independent. In fact, the first one is largely dependent on the second. When the futures price is at a premium over the ready price their correlation is expected to be high. But when the futures price is at a discount below the ready price, a low correlation may be anticipated. A low correlation emerges in the latter case because the ready and futures prices then represent not the same goods but different goods. While the ready price represents the low level of present stocks, the futures price represents goods anticipated to be produced in future. When, however, the present stocks are large and are expected to be carried over to the future, both ready and future prices represent the same stocks. In such a situation, the futures prices is above the ready price by approximately the cost of storage. Since, however, both prices then represent the same basic stocks, a high correlation is expected

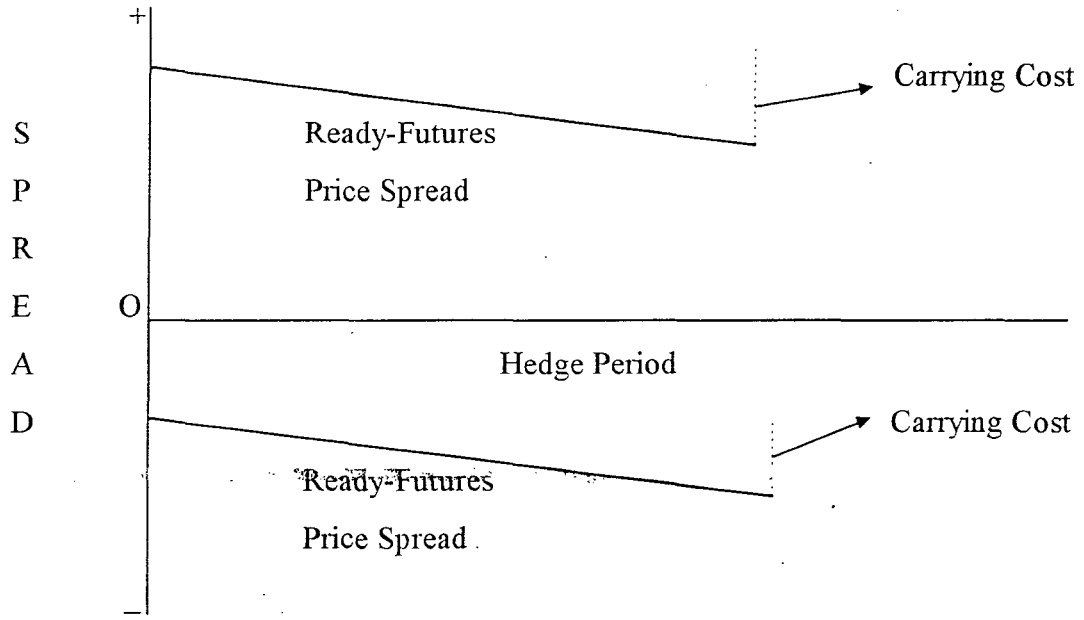
[2] H. Working, "Price Effects of Futures Trading", *Food Research Institute Studies*, Vol. 1, 1960.

contracts on the last day of the maturity month. These due rates are determined mainly on the basis of the prevailing ready rates. This practice necessarily avoids the drift away of both ready and futures prices from one another.

A complete parallelism between ready and futures prices, however is neither theoretically expected nor desirable for effective hedging in agricultural commodities. As it is, these commodities are grown seasonally but are held in store for sale and consumption round the year. Hence, over any period within a crop year, the ready price of an agricultural commodity is expected to rise more (or fall less) than the futures price by an amount equal to the carrying costs. Such carrying costs are included *ab initio* in the futures price but not in the ready price, since unlike ready contracts which contemplate immediate deliveries, futures contracts assume deliveries of stored commodities at stipulated future delivery months. A seller of futures contract must therefore include the total carrying costs which he expects to incur till the delivery month in the price of his sale. But the carrying costs are reflected in ready prices only as and when they are incurred on storage. As a result, in agriculture commodities, the ready price is expected to rise relatively to the futures price from the commencement of marketing in one crop year till its beginning in the next.

For hedging to be effective, the deviation from perfect parallelism in the ready-futures price movements arising from the influence of the carrying costs as aforesaid is, in fact, helpful as it enables the selling hedgers to earn their carrying costs, and also ensures that the buying hedgers who avoid the holding of physical stocks include such charges in the price they offer. In other words, effective hedge presupposes that if the relationship between the ready-futures price shows a positive spread (i.e., the premium for futures over ready) , such spread shall narrow down during the hedge period by an amount equal to the carrying costs actually incurred during the period; while in the converse case, the negative spread (i.e., the discount for futures over ready) shall increase by the amount of such costs. Graphically, the movement of the spread over the hedge period should be as shown in Figure 1.3, if hedges are to be fully effective for both long and short hedgers.

Figure 1.3 : Expected Movement in Ready-Futures Price Spread for Effective Hedging



If, unlike as shown in Figure 1.3, the spread (positive or negative) remains unchanged, the buying hedgers such as exporters, processors, millers, etc. gain from hedging more than the selling hedgers like dealers and stockists, since the latter are then unable to earn the carrying cost from the former. But a perfect hedge envisages neither gain or loss to either the buying or the selling hedger. Hedge is an insurance against price risk and not a device for avoidance of carrying costs by buying hedgers. Carrying costs are like all other marketing costs; the sellers must earn these in order to ensure smooth and efficient marketing of commodities at all time. Evidently, a futures market mechanism which does not enable the merchants and stockists from earning legitimately their carrying costs is far from perfect. In other words, the ready-futures spread being negative should widen by the amount of the carrying costs so as to provide for equal hedging benefits to both buying and selling hedgers. This is true irrespective of whether the prices actually decline or rise. In the like manner, perfect hedgers visualise diminution in the ready-futures spread by the amount of carrying cost, if such spread happens to be positive at the time of placing the hedge.

While the unvarying price spread is thus decidedly undesirable for effective unbiased hedging in seasonally grown agricultural commodities, it should be recognised that the variations in spread that do not reflect the true carrying costs also impair the utility of the futures market to one or the other class of hedgers. The implications of such variations on hedging effectiveness differ according to their nature and magnitude, and also depending upon whether the hedging is either 'long' (buying) or 'short' (selling). The major implications of hedging effectiveness of futures market via price spread which follows from the basic hypothesis that hedging is an arbitrage between the ready and futures markets are: (i) If the positive spread widens or the negative spread shrinks, the buying hedgers gain more than the selling hedgers; (ii) If the positive spread shrinks or the negative spread widens by an amount more than the carrying costs, the selling hedgers gain from hedging more than the buying hedgers; (iii) If the positive spread shrinks, or the negative spread increases by an amount less than the carrying costs, the buying hedgers gain from hedging more than the selling hedgers; (iv) If the price spread remains unchanged, the buying hedgers gain from hedging more than the selling hedgers; and. (v) If the positive spread shrinks or the negative spread widens by the amount of carrying costs, hedging is equally effective for both buying and selling hedgers in that their gains (losses) in the ready market are fully offset by losses (gains) in the futures market.

For the purpose of the distinction between hedges that reduce losses in the ready market and those which reduce gains in such market, hedges are deemed to be effective not only when they offset or reduce losses in the ready market, but also when they likewise offset or reduce gains. A futures market, however, is really attractive to a hedger so long as it reduces his loss in the ready market; any gain in such market, if he can foresee it, he would steadfastly seek to retain, by avoiding hedging. Similarly, a loss to a short hedger is a gain to a long hedger and vice versa, a futures market which benefits solely, or even mostly one of these two classes of hedgers necessarily becomes unattractive to the other. The attractiveness of a futures market to both long and short hedgers rests on three important preconditions. Firstly,

it is essential that, in the long run, the ready market should decline as many times as it advances, while the average rise and fall therein should be of the same or almost equal magnitude. Secondly, the gains or losses from changes in ready prices over relatively short periods should be occasionally so large enough as to unsettle most, if not all, trade interests in the ready market. And lastly, but more importantly, it is necessary that not only should the hedging efficiency of the futures market be both positive and high, it should be also unbiased between long and short hedgers so that it should reduce gains in the ready market as effectively as it should reduce losses therein, and vice versa.

IV) SPECULATION :

Hedging on futures markets cannot be practised unless there are operators willing to assume the risk which the hedgers desire to transfer. These operators are called speculators. They, thus provide the much needed breadth and liquidity to the futures market which in their absence, would remain narrow and unstable. A speculator operating on a futures market is one who buys or sells futures contracts without any corresponding (countervailing) commitments or transactions in the actual commodity with a view to making profit from the fluctuations in the prices. Futures markets are sometimes compared to the insurance markets; hedgers pay a risk premium (comparable to an insurance premium) to speculators in order to cover their risks. If this comparison is correct, it would mean that hedgers follow a sub-optimal strategy. In the long run they would systematically lose out to speculators. However, if markets are liquid enough, because of the large degree of competition for buying and selling contracts, there is no real risk premium in the long term. The costs involved are those directly related to executing the financial transaction.[1]

The basic distinction between hedge and speculative transactions on a futures market is that while in the case of a hedge transaction, there is a corresponding opposite transaction in the actual delivery market, in the case of a speculative

[1] The concept of risk premium and associated efficiency in the futures markets has been discussed at length in Section VI of this Chapter.

transaction, there is no corresponding transaction in the delivery market. While the motives of the speculator in entering into futures transactions are different from those of a hedger, the form or nature of transactions entered into by both on the futures market is similar. When a transaction takes place on a futures market, the transaction may well be between two hedgers or two speculators or between a hedger and a speculator.

The speculators may be long or short speculators. The ***long speculators*** are those who expect the futures price to rise above the current level and assume risk by purchasing futures contracts. ***Short speculators*** are those who expect the futures price to fall and therefore are sellers of futures contracts. In a futures market, the total short selling position, made up of short hedgers and short speculators, and the total long buying position, made up of long hedgers and long speculators, must always be equal. Any excess of short over long hedging must be balanced by an equal excess of long over short speculation. Thus, speculators in futures markets play the vital role of absorbing the frequent imbalance in demands of commercial buyers and sellers. In other words, the net open position by hedgers is taken over by the net open position by speculators. Since short hedging exceeds long hedging for most of the crop year, hedgers are generally short and speculators, therefore, are generally long. In order for speculators to make money, futures prices must tend upward when speculators are long futures and futures prices must trend downward when speculators are short futures.

It is the ease with which speculation can be practised on the futures market that has given rise to much of the criticism against futures trading. There are, however, two inherently constructive or self-correcting elements in speculative activity in a futures market. First, it is in the interest of the speculators themselves to be well informed about the market conditions and important developments to avoid wrong decisions as such decisions are likely to result in heavy losses. It is this fear of losses which brings into operation their best judgement on the current and the prospective demand and supply situation. Secondly, the inefficient speculators, i.e.,

those who tend to make wrong forecasts, are bound to lose and get eliminated from the market.

According to Peck (1985)[1] speculative trading can be classified into three types : (i) position trading; (ii) spread trading and (iii) market making. Their differences lie mainly in terms of the length of time each position is held.

Position trading absorbs the imbalance between aggregate commercial buyers and sellers of futures contracts with the expectation of making a profit from price changes over time. Position traders hold their positions for a day to as long as several weeks and include professional and amateur traders.

Spread trading absorbs imbalances in the degree of futurity required by commercial buyers and sellers. For example, if a buyer wishes to purchase a nearby future and a seller requires a more distant future, the ***spread trader*** or ***spreader*** may take on both positions with the expectation of making a profit from the relative price changes rather than actual changes *per se*. Spread trading may be performed within the same market for contracts with different maturities (***intra-market spread***) or between two or more markets for the same period (***inter-market spread***). Inter-market spreads include those between two or more markets for the commodity or between markets for different commodities.

Market making or ***scalping*** absorbs short-term imbalances in timing of orders to buy and sell within a trading day. Markets makers buy and sell large volumes rapidly during the daily trading session, holding positions for only a short time and rarely carrying positions overnight. It is ready to either buy (say) 1/4 of a rupee below the last price or sell 1/4 rupee above it. Market makers do not distinguish among orders coming to the floor exchange; their purpose is simply to match orders from buyers and sellers. Thus they may buy or sell from both hedgers and other speculators.

There has been a lot of debate over whether speculators as a group make money. Some, like Keynes (1930), Hicks (1939), and Cootner (1967)[2] argue that

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[1] A. E. Peck, as cited in *"National Conference on Commodities Futures Markets"*, ASSOCHAM, April 25-26, 1996, New Delhi.

[2] J. M. Keynes, *"A Treatise on Money"*, Vol. 2, London, 1930; J. R. Hicks, *"Value and Capital"*, London, 1939; P. H. Cootner, "Speculation and Hedging" *Food Research Institute Studies*, Vol. 7, Supplement, 1967.

speculators make money because they bear risk and must be compensated for risk-bearing services. They usually argue that speculators tend to be long because hedgers tend to be short because on balance there are more short hedgers than long hedgers. Sales by hedgers force the futures price below the expected spot price and lead to the situation of normal backwardation. Speculators make money on upward trend in futures prices.

Others, particularly Telser (1958, 1959)[1], argue that speculators as a group are not risk-averse and do not require compensation for risk. This is possible if there are different categories of speculators. Professional speculators have to make money. Otherwise, they would be unable to support themselves. But amateur speculators could lose money to professional speculators, so speculators as a group just break even. Telser thus argues that speculators as a group do not make money even they bear risk. If Telser's argument is true, hedgers are better off because they are provided insurance at no cost.

Finally, some argue that the amount of risk actually borne by speculators is small, if risk is properly measured. Dusak (1973)[2] takes this position. In modern finance theory, the appropriate measure of risk is the amount of risk that cannot be diversified away. In other words, risk is measured in a portfolio context. Dusak argues that commodity risk can be diversified away so that the systematic risk of a commodity is zero. That means that speculators do not require a risk premium. Competition among speculators for futures contracts will then drive the futures price to that point where futures price equals the expected spot price. To the extent that the systematic risk of futures contracts is negative, speculators might be willing to accept losses. For example, suppose futures were a good inflation hedge, speculators would be willing to lose money in futures as a way to reduce the risk in other parts of their portfolio.

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[1] L. G. Telser, "Futures Trading and the Storage of Cotton and Wheat", *Journal of Political Economy*, Vol. 66, 1958; L. G. Telser, "A Theory of Speculation Relating Profitability and Stability", *The Review of Economics and Statistics*, Vol.41, 1959.

[2] K. Dusak, "Futures Trading and Investors Returns : An Investigation of Commodity Market Risk Premiums", *Journal of Political Economy*, Vol. 81, 1973.

The Capital Asset Pricing Model[1] indicates that speculators could receive a risk premium for holding futures contracts. Obviously, some other group would have to pay a risk premium, since the futures are a zero sum game. Hedgers may be willing to pay a risk premium to eliminate the risk of holding the commodity. The situation is more complicated because a hedger would consider not only the correlation between the futures price and the price of the underlying commodity but also between the futures and the hedger's entire portfolio of all assets. Annexure V shows how hedgers and speculators interact to determine a futures price in relation to the expected spot price and the current spot price.

V) FUTURES MARKET, SPECULATION AND PRICE STABILITY :

At this stage it is necessary to investigate into the alleged effects of futures trading on prices by an enquiry as to why futures trading influences prices. The recent attacks against the futures markets are based on the patent misconception about the influence of futures trading on commodity prices. It is frequently alleged that the futures markets have been aggravating the increasing trend in commodity prices. Surprisingly such allegations have never been documented by any empirical or statistical evidence, but are conceived by the erroneous belief that there are no effective limits to the buying in the commodity futures market. Thus, in the ready market, the volume of buying by merchants is always restricted by the availability of storage and the financial resources of the merchants. But there are no similar restrictions on the operations in the futures markets. The unscrupulous operators, therefore, make large purchase in futures market in times of shortage, with a view to 'squeezing' the sellers. When the sellers attempt to either hectically cover or obtain the deliverable commodity, an artificial rise develops in the ready price. As this situation can be repeated from delivery to delivery, it is supposed that with futures

[1] J. Lintner, "Security Prices, Risk, and Maximal Gains from Diversification" , *Journal of Finance*, Vol. 20, 1965. and W. Sharpe, "Capital Asset Prices : A Theory of Market Equilibrium Under Conditions of Risk", *Journal of Finance,* Vol.19, 1964.

markets functioning, ready prices can easily be maintained at levels higher than those at which they would have ruled had such markets not been in existence.

But even if it is granted that there are no effective limits to accumulating 'short' or 'long' commitments in the futures market and that, at times, a few unscrupulous operator can successfully engineer squeezes in maturing deliveries of the futures contract, it is doubtless that the price aggravating influence of the futures market has been exaggerated by most of the critics. When it is recognised that a successful bull 'squeeze' leads to artificial rise in ready price owing to frantic covering by bears or their attempt to buy available deliverable supplies, it is at once realised that the effect of such 'squeeze' is necessarily short-lived and confined to only the delivery month of a futures contract. Since in most of the present futures markets in the country, barely three or four deliveries are traded in a year, it is manifest that the alleged price aggravating influence of futures markets is unlikely to extend beyond 3 or 4 months in a year.

The price of any commodity, for immediate or forward delivery, is always determined after deliberations and negotiations between the buyer and the seller. In these negotiations, the buyers and the sellers are generally influenced by their own judgements of the current and the anticipated future supply and demand of the commodity and the present and the expected prices thereof. If, therefore, futures trading is to exert any influence on such negotiated prices, it must affect the judgement of either the buyers or the sellers, or both. It can influence their judgements in two ways.

Firstly, the knowledge of the current prices prevailing in the futures market would inevitably influence, albeit indirectly, the price judgement of buyers and sellers of the actual commodity. Both in the organised and unorganised markets, many buyers and sellers transact business for immediate as well as deferred delivery. As a result, their ideas of prices are influenced considerably by the prices prevailing not only in the spot markets but also in the markets for deferred delivery transactions. Though futures contracts are normally intended for hedge and speculative purposes, they are also useful for making genuine purchases or sales when the buyers and

sellers thereof receive or give delivery during the delivery month. Thus, for a prospective buyer or seller of goods, under certain circumstances, there is a choice as to whether he should enter into a futures contract or a deferred delivery contract. In this way, the transactions in the futures and in the deferred delivery contracts can become substitutes for each other. Since the futures contract is more active, the futures prices substantially influence the decisions of the buyers and sellers in the deferred delivery contracts. There is a similar influence of futures trading on spot transactions towards the closing stages of the delivery month of the futures contract., when actual deliveries can be given and taken and thus transactions in the futures can compete for actual business with the ready transactions, particularly when the ready prices are out of alignment with the futures prices. In this way futures prices may directly influence the spot prices.

Secondly, futures trading influences the spot and the deferred delivery contract prices through its hedging function. The market demand for a commodity arises from two sources, viz. the immediate or current consumption and inventory demand. The latter source of demand emanates from the imbalance between the production and the consumption at a point of time. The surplus must be held in store for future consumption.

Streit (1983)[1] lists five a priori reasons why futures trading may have a stabilising effect on price volatility. First, futures markets allow information to be diffused more rapidly, and by increasing the speed of market adjustment reduce the size of price changes needed for equilibration. The argument is that, in response to information about a rise in future demand, say, producers can now plan to increase futures supply and mitigate the futures price rise. However, with commodities that are continuously stored, changes in futures prices will have a direct effect on current prices, and hence make them more volatile. Thus one must be more careful to distinguish the effect of futures markets in reducing price fluctuations between years and, and their effect on price volatility within a year. The second argument is that futures markets allow traders to choose whether to buy in the spot market (e.g., for

[1] M. E. Streit, (ed.), "*Futures Markets : Modelling, Managing and Monitoring Futures Trading*", Florence, 1983.

storage) or in the futures market. If the spot prices rise relative to forecast prices, such traders will shift to the futures market, reducing the pressure on the spot market. This argument seems closely related to the next, which is that futures markets reduce the risk of inter-temporal arbitrage via storage, and hence facilitate this form of price stabilisation. This in turn means that disturbances are effectively spread over current and future periods, rather than being concentrated in the present. The fourth argument is that futures markets should eliminate cobwebs caused by inefficient or adaptive forecasting methods, and hence reduce endogenous price fluctuations. Finally, futures markets broaden the market for information relevant to the price and hence reduce forecast errors.

The stabilising influence of speculation is the very raison d'être of a futures market. While ready and futures prices in any commodity are determined by the same basic conditions of supply and demand, they do not as a rule reflect them at exactly the same moment. The futures market usually receives and interprets the data of changing market conditions well before the ready market decides to act upon it. This is because of the very nature of the function of the two markets. In the futures market, the lead is taken by speculators interested solely in price changes, while in the ready market, the initiative rests with trade interests who have less direct concern for price movements.

This kind of stabilising influence brought about in the price-level of any commodity by futures trading can be measured through Prof. Kaldor's concept of : " ...the elasticity of expectations and the elasticity of speculative stocks together determine what may be termed the degree of price stabilising influence of speculation, the extent to which price variations due to outside causes are eliminated by speculation. This may be measured by the proportionate change in stocks in response to a given change in the current price, since the larger this change, the smaller the extent to which any given change in outside factors (a shift in demand or supply) can affect the price. If we denote the degree of price-stabilising influence by S, the elasticity of speculative stocks by e, and the elasticity of expectations by n, their relation is as follows:

$$S = -e(n-1) \qquad \text{----- (1.1)}$$

Since e cannot be negative, the expression is negative or positive according as n is greater or less than 1."[1]

Evidently, irrespective of the degree of the elasticity of speculative stocks, one can answer the question whether speculation have a stabilising influence in a given commodity or not by mere observation of the elasticity of expectations. If the latter is greater than unity, speculation destabilises, but if it is less than unity, speculation certainly imparts a stabilising influence.

The elasticity of expectations -- a concept of Prof. Hicks -- has been defined "as unity when a change in the current price causes an equiproportionate change in the expected price. Hence, if the elasticity of expectations is positive, but less than unity, speculation will still have stabilising influence, though of course a weaker one than if the elasticity is zero or negative."[2] Inelastic expectations impart a stabilising influence as arbitrage transactions in any commodity market tend to maintain the basic equilibrium between ready and futures prices as determined by the carrying costs (i.e. costs of carrying goods from one period of time to another).

The "expected price" of Prof. Kaldor constitutes the "representative expectation" of the trade, but differs from the actual futures price of the market by an amount known as "marginal risk premium" -- a remuneration which hedgers are called upon to pay to the speculators to induce the latter to absorb the excess hedges. The futures price is higher or lower than the expected price, according as the 'net' hedges (arrived at after setting off the 'buying' hedges against the 'selling' hedges) that are required to be absorbed by the speculators, belong to the 'buying' or the 'selling' class. Given a marginal risk premium, therefore, any change in the futures price will always be equiproportionate to the change in the expected price. Prof. Kaldor's "elasticity of expectations" can therefore be best measured by substituting the concept of 'futures price' for the concept of 'expected price'. Besides, as

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[1] N. Kaldor, "Speculation and Economic Stability", *Review of Economic Studies*, Vol. 8, 1939.
[2] J. R. Hicks, "*Value and Capital*", Second Edition, 1964.

Hawtrey had pointed out, the introduction of the expected price in any form in the theory of forward markets only tends to create additional complications. According to Hawtrey, "the expectations formed by the professional dealers and the speculators themselves do not take the form of an estimate of what the price will be at definite future dates. The speculative buyer merely anticipates a rise and the speculative seller a fall. The speculator need not be particular as to what future date he deals in. And he need not make any estimate of the extent of the rise or fall, except that it will be considerable enough to be worth his while."[1] Without going further into the merits of introduction of 'expected price' in any theory of forward markets, it is clear that for the purpose of measuring the degree of price stabilising influence of speculation in any commodity market, one can well substitute for the rather nebulous concept of "elasticity of expectations", the more precise concept of "elasticity of futures price." However, such a methodology can hold true only when the expectations formed by the different agents are homogenous to a significant extent. If, on the other hand, the expectations reveal a high degree of heterogeneity, the elasticity of futures price will not serve as the right yardstick for measuring elasticity of expectations.

According to the traditional theory, the proponents of the stabilising feature of futures trading on the ready prices does not refer to the long-term trend of prices of all commodities. Neither do they assert that futures trading eliminates the small hour-to-hour oscillations in the market price. In fact, they fear that probably such price variations tend to increase and not diminish as a result of speculation in futures trading. What they specifically claim is that is that futures trading reduces those major variations in prices which are noticed in any commodity from season to season and particularly from month to month within a season. In other words, the steadying influence of futures trading is claimed mainly in regard to the seasonal variations in prices, resulting specially from the pattern of production and marketing of agricultural commodities. To some extent, a similar influence is also claimed in respect of short-term (intra-month) price variations which are occasioned by temporary imbalances in supply and demand.

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[1] R. G. Hawtrey, "Mr Kaldor on the Forward Market", *Review of Economic Studies*, Vol. 7, 1939-40.

The hypothesis that futures trading generally stabilises prices over both long and short duration or at any rate moderates the fluctuations therein and reduces the amplitude of such fluctuations, rests on the assumption that speculators are essentially men of better than average foresight and judgement who can foresee the non-speculative events affecting supply and demand before anyone else. A contrary assumption is held to be untenable, since that would imply that "speculative activity would be attended by a loss, and not a gain; and such speculators would be speedily eliminated. Only the speculator with better than average foresight can hope to remain permanently in the market. And this implies that the effect of the speculative activity must be price-stabilising and in the above sense, wholly beneficial"[1] (Kaldor).

Extending the line of argument first set forth by Keynes with reference to the long-term expectations and the role of speculators in the investment market. Kaldor has pointed out that even in commodity markets, the price steadying effect of speculation "implies a state of affairs where speculative demand or supply amount only to a small proportion of total demand or supply, so that speculative activity, while it can influence the magnitude of the price change, cannot at any time change the direction of the price change. If this condition is not satisfied, the argument breaks down. It still remains true that the speculator, in order to be permanently successful, must possess better than average foresight. But it will be quite sufficient for him to forecast correctly (or more correctly) the degree of foresight of other speculators, rather than the future course of the underlying non-speculative factors in the market. If the proportion of speculative transactions in the total is large, it may become, in fact, more profitable, for the individual speculator to concentrate on forecasting the psychology of other speculators, rather than the trend of the non-speculative elements. In such circumstances, even if speculation as a whole is attended by net loss, rather than a net gain, this will not prove, even in the long-run, self-corrective. For the losses of a floating population of unsuccessful speculators will be sufficient to maintain permanently a small body of successful speculators; and the existence of this body of successful speculators will be a sufficient attraction to

[1] N. Kaldor, "Speculation and Economic Stability", *Review of Economic Studies*, Vol. 7, 1939-40.

secure a permanent supply of this floating population. So long as the speculators differ in their own degree of foresight and so long as they are numerous, they need not prove successful in forecasting events outside; they can live on each other."[1]

While it may be admitted that the third and the higher degrees of speculation referred to by Keynes ("where we devote our intelligence to anticipating what average opinion expects the average opinion to be")[2] would have a destabilising effect on prices, contrary to Kaldor's fears there is reason to believe that the volume of such high degree speculation is small and its effect is less severe in commodity futures markets than in security markets. Two arguments seem to support this belief.

Firstly, the great mass of statistical data on hedging and speculation in the commodity futures markets collected in the USA has shown that the amount of speculation varies mainly in response to the amount of unbalanced hedging, and therefore the commodity futures markets are essentially hedging markets and not speculative.

Secondly, investments in "commodities" and "commodity futures" are, as a rule, of a much shorter duration than investments in shares and securities dealt with an organised stock exchanges. Keynes has directed his criticism mainly against the speculation in the latter markets. The value of "investments' in securities and shares which represent generally capital assets must primarily depend upon the long-term prospective yield of the assets. But our knowledge of the various non-speculative factors which will determine the yield of any such asset some years hence is necessarily negligible.

The situation is far different in organised commodity futures markets. The investments in commodities, especially of agricultural origin in which future markets abound, are usually for short periods of less than three months though at times, they may extend even longer but scarcely beyond one, year. Price forecasting over such short periods on the strength of very reliable information gathered about such non-speculative factors like carry-overs, weather, and crop reports, trends in internal and export demand, foreign crop news, etc. is not altogether a difficult task. Many traders

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[1] N. Kaldor, "Speculation and Economic Stability", *Review of Economic Studies*, Vol. 7, 1939-40.
[2] J. M. Keynes, "*The General Theory of Employment, Interest and Money*", Macmillan, 1954.

and professional speculators in such markets, in fact, make all efforts to obtain from various sources and agencies all relevant information affecting prospective supply and demand in order to anticipate more correctly the future trend of prices, and organise their investments in both commodities and commodity futures on the basis of the information so gathered. This is not to say that the third and the higher forms of speculation referred to by Keynes are totally absent from commodity futures traders and scalpers who hope to profit through quick 'turns' in prices and therefore may, at best, influence only the very short-term (day-today or intra-day) fluctuations in prices. A relatively larger share of speculation on an organised commodity futures market, however, is concentrated in the hands of big traders and professional speculators who expect to earn fairly large amounts from their technical training and specialised knowledge of non-speculative factors affecting supply and demand rather than from their anticipation of other speculators' forecasts. Organised futures trading in commodity markets is, therefore, more of an 'enterprise' than "speculation". In that event, to borrow Keynesian phraseology again, "speculators may do no harm as bubbles on a steady stream of enterprise."[1] There is thus strong reason to assume that futures trading in commodity markets can have the price steadying influence attributed to it by the traditional theory, though perhaps the minor hourly and daily oscillations in prices may at times increase.

Friedman's[2] argument was that speculators make profits by moving prices towards the correct, i.e. equilibrium, level and in doing so, tend to reduce the fluctuations of the futures price around the best estimate of the future spot price. Hart[3] showed that this argument was unconvincing, for in his model, a sophisticated speculator can make money by exploiting the naive forecasting rules of less sophisticated agents, and profitably destabilising the futures price. Newbery[4] also demonstrated that if a producer has market power, then if all agents have rational

[1] J. M.Keynes, "*The General Theory of Employment, Money and Interest*", Macmillan, 1954.
[2] M. Friedman, "*Essays in Positive Economics*", Chicago University Press, 1953.
[3] O. D. Hart, "On the Profitability of Speculation", *Quarterly Journal of Economics*, Vol. 91, 1977.
[4] D. M. Newbery, "The Manipulation of Futures Markets by a Dominant Producer", in R. W. Anderson, (ed.), *The Industrial Organization of Futures Markets*, Lexington Books, 1984.

expectations, it may pay the dominant producer to destabilise the spot market, and possibly to engage in destabilising speculation.

To argue for the stabilising effects of speculation, then, it is important to exclude irrational forecasting behaviour and market power. Kawai[1] has constructed a rational expectations model of storable commodities in which even if all agents have rational expectations, no market power and there are no 'speculative bubbles'; the introduction of a futures market, which facilitates speculation, may destabilise the spot market.

In an alternative article, Newbery[2] explains how speculation may destabilise prices. The basic idea is very simple. Futures markets offer insurance, and thereby encourage agents to make riskier decisions than they otherwise would. In one-commodity partial equilibrium models, the effect is typically to increase the supply of the risky crop, and hence, to lower the average market clearing price. If, however, risk is additive and supply and demand schedules are linear, this average supply response has no direct effect on the variability of supply, and hence, no direct effect on the price variability, measured by its variance. It will typically increase its coefficient of variation slightly by reducing the mean price.

Instead, futures markets affect spot price variability by increasing the amount of storage, as it reduces the risk of holding stocks, and hence effectively lowers the cost of storage. In Turnovsky and Campbell's model[3], storage is non-stochastic, so increased storage necessarily reduces the average degree of inter-year price variability. In Kawai's model[4], storage is subject to (unexplained) stochastic shocks, and more storage means that these shocks will be larger, and, if they dominate the other random shocks, may destablise the spot price.

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[1] M. Kawai, "Price Volatility of Storable Commodities under Rational Expectations in Spot and Futures Markets", *International Economic Review*, Vol. 24, 1983.

[2] D. M. Newbery, "When do Futures Destabilize Spot Prices ?", *International Economic Review*, Vol. 28, 1987.

[3] S. J. Turnovsky and R. B. Campbell, "The Stabilizing and Welfare Properties of Futures Markets : A Simulation Approach", *International Economic Review*, Vol. 26, 1985.

[4] M. Kawai, "Price Volatility of Storable Commodities under Rational Expectations in Spot and Futures Markets", *International Economic Review*, Vol. 24, 1983.

Thus, futures markets encourage risk taking, and whether this stabilises or destabilises the spot price depends on whether the risky activity tends to stabilise or destabilise spot prices. Normally storage is thought to be relatively non-stochastic but subject to price risk, and if it is encouraged, then price stability will also be encouraged. But once it is recognised that (on the assumption of rational expectations) the main effect future markets have is on risk taking, then it is easy to see how risk taking might destabilise spot markets. The simplest model is one in which producers can produce a non-storable good in either a safe way or a risky way. The risky method is on average more productive, so farmers will choose to allocate a fraction of their land to the risky method. A futures market will reduce the risk of producing the risky crop, and hence increase the fraction of land allocated to it. This will increase the output variability and, as there is no storage, the increased output variability will increase the variability of the spot price.

Newbery's model demonstrates that as speculators increase their level of activity on futures markets, so they provide increasing levels of insurance to farmers, who are induced to increase their supply of the risky crop, and so increase the spot variability. The model was kept simple by assuming no storage, and only producers and speculators trading in futures markets. Farmers sell futures to speculators, who are distinguished by their lack of income from production (or from any other source correlated with realisation of the risky crop). Speculators affect stability by offering price insurance which reduces the risks of certain activities. and stimulates their supply. Often these risky activities tend to reduce price instability -- storage is the leading example -- but if the risky activity increases price risk, then speculators will tend to increase price instability. This happens because producers are encouraged to change to a more risky but more profitable mode of production.

If futures extend only for a year or less, then agents making long term investment decisions may face greater risk as a result of the increased volume of short term speculative activity. It is possible that the costs of this greater long term risk will exceed the benefits to the short term hedges of providing the futures market.

There has also been a lot of debate among many American econometricians about the role of profitable speculation in price stability. Baumol[1] set the ball rolling in 1957 by criticising the universally accepted proposition that profitable speculation necessarily stabilises prices. He presented a model of speculative behaviour where speculators earn profits and yet destabilise prices. According to his model, in the usual cycles of price fluctuations, if speculators are assumed to buy after the up-turn in prices has begun and sell after the down- turn has set in, speculators may no doubt earn profits, but they may also aggravate the upward and the downward movements in prices. Baumol does not deny that such speculation is price stabilising in its initial run, but asserts that, on balance, (probably because of the widespread 'movement' trading in futures markets where the small operators are said to follow the lead given by the big traders and speculators) it is destabilising. That is to say, because of speculation, a rise or fall in price, always feeds on itself.

Telser[2] presenting a counter-model argues that the profits of speculators are larger if they enter into commitments before the turning points in the price cycle are reached than after. The speculators in futures markets, therefore, employ their technical knowledge and skill, and acquire specialisation in predicting such turning points. Consequently, their operations, instead of extending the turning points, tend to cut down the edges of such points.

Since the debate began, several econometricians have entered the field in support of one or the other side. But in the absence of any empirical investigation into either the speculative behaviour or the pattern and effects of speculative operations, the debate has so far yielded little valuable results. Without entering into this controversy, suffice it to note that the price fluctuation cycles referred to by both Telser and Baumol relate to those very short-term price oscillations which even the traditional theory does not assert emphatically as being reduced by futures trading.

However, while futures markets may indeed reduce the instability in spot markets, it is not immediately clear why this is beneficial. Since producers are more

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[1] W. S. Baumol, "Speculation, Profitability and Stability", *The Review of Economics and Statistics*, Vol. 39, 1967.

[2] L. G. Telser, "A Theory of Speculation Relating to Profitability and Stability", *Review of Economics and Statistics*, Vol. 41, 1959.

specialised than consumers and hence more directly affected by price instability, the relevant question is, how do producers benefit from price stabilisation? The standard argument, defined at some length in Newbery and Stiglitz[1] (1981), is that producers are concerned not so much with price risk but with income risk, i.e., with fluctuations in their incomes. The two coincide only if production is certain but prices are risky, so that price fluctuations are the sole cause of revenue and profit fluctuations. In such cases stabilising prices will indeed stabilise incomes, which, other things being equal, will raise producers' welfare. However, particularly for agricultural products, supply fluctuations are a major source of instability, and stabilising prices may even increase income stability. Thus, price stabilisation schemes are at best an indirect solution to the real problem of income instability, and as such may be inferior to other methods of reducing income risk, such as futures markets.

VI) MANIPULATION :

We have seen that in order to make the futures markets liquid, presence of speculators in the market is essential. Without speculators, futures markets cannot function. However, the government has to guard against manipulation. There is a clear conceptual difference between manipulation and speculation. Speculation involves trading based on anticipated future price movements brought about by the market forces, whereas manipulation involves attempts to move prices in reverse direction to what the spot market would dictate.

Manipulations are of several kinds. The more well known types which may produce disastrous price effects are in the form of either corners or bear raids. A ***corner*** aims at raising prices through heavy purchases in the futures market by concerted efforts of one or more persons. A ***bear raid***, on the other hand, is a manipulation which aims at depressing prices through the pressure of heavy sales.

Most manipulation attempts involve simultaneous transactions on the physical and futures markets. Manipulation is possible whenever an entity acquires excessive

[1] D. M. Newbery and J. E. Stiglitz, "The Theory of Commodity Price Stabilization", in M. E. Streit (ed.), "*Futures Markets : Modelling, Managing and Monitoring Futures Trading*", Blackwell, 1983.

control over demand or supply and when other suppliers or users cannot respond quickly enough to deliver or receive quantities in a specific location within the specified time. The ease with which trading in a commodity futures contract can be manipulated depends partially upon the delivery terms specified for that futures contract. Manipulation is easier, the more restrictive the limitation upon acceptable grades, origins, delivery points and the alternative delivery procedures.

While corners can be nursed only when supplies are very scarce, bears cannot raid the futures market unless supplies are excessively large. Less spectacular than the manipulative corner but perhaps a little more frequent is a manipulative squeeze. A ***squeeze*** is a relatively small corner, occurring in or near a delivery month. It usually emerges when there exists a scarcity of the deliverable commodity. The long interests in the market while not desiring the commodity for either commercial purposes or consumption, may hold out for delivery in order to profit by the temporary price rise caused by the efforts of shorts to cover hectically or to obtain the deliverable commodity. The effect of any squeeze is necessarily short lived and confined to only the delivery month of a futures contract. At the end of the delivery month, as the longs dispose of the unwanted supplies acquired in 'deliveries', prices once again slip back to the ordinary commercial level. In the process damage is caused to the economy.

Manipulation causes market disruption and hurts users thereby making it prudent for the exchanges and regulatory authorities to establish methods and rules to detect and punish manipulation. Thus, the futures contracts have necessarily to be subjected to social control and regulation.

VII) FUTURES MARKETS & MARKET EFFICIENCY :

Futures markets have both an observed and unobserved element of information because of its multi-dimensional nature (i.e., involving a contract today for a spot transaction in the future). The observed element relates to contract prices, volume of transactions in contracts, and open interests (contracts outstanding); the

unobserved element relates to expectations about spot prices (and, more broadly, spot markets) in the future. Thus, the quality of information in futures markets involves not just the liquidity and pricing efficiency of the observed element, but also the quality of information that the observed element conveys about the unobserved element, particularly about expected spot prices.

The observed and unobserved elements of futures markets typically diverge; in particular, a futures price normally is different from the spot price expected to prevail in the future because of the typical predominance of hedging, on one side of the market and the positive cost of speculation on the other. The observed and unobserved elements are, however, inextricably interrelated. Improvement of information about the unobserved element has fostered the development of information about observed elements of actual markets. In turn, development of actual markets (in size and efficiency) has served to convey information about the unobserved element.

Because of their multi-dimensional nature, futures markets have an additional aspect of market efficiency. Specifically, the greater the accuracy with which futures prices serve as estimators of future spot prices, the better is the quality of information imparted by futures markets and thus the more efficient are the markets. The accuracy with which futures prices estimate future spot prices cannot easily be discerned by comparing futures prices with the corresponding subsequent (or realised) spot prices. With the passage of time, new information may appear and the evaluation of existing information may change. In view of the fact that a plethora of information is relevant to a futures price, that each item of information may be continually changing, and that the digestion of this information (which is spread among countless firms and individuals) is also continually changing, we must expect rather continual changes in prices and price expectations.

In addition, there may be instances in which a current futures price represents something of a compromise between two or more plausible modes of an expected distribution of future spot prices, each of which is predicated on a different assumption about a governmental policy decision that could be taken in a relevant

area. For example, during the fixed exchange rate regime, futures prices were influenced by traders' expectations about the timing and magnitude of devaluation decisions. Furthermore, to the extent that premiums are embedded in futures prices. such price will change as the maturity date of the contract approaches. For all of these reasons, it is not surprising that there are usually wide discrepancies between current futures prices and the spot prices that later materialise.

A critical issue for any developing country contemplating the use of futures markets is the cost of using these markets. These costs are essentially of three kinds. The first cost of operating in the futures markets arises from the transaction cost which includes brokers' and other commission fees, the cost of maintaining margins, and others. This cost is, however, likely to be much smaller than the two costs discussed below and in any case does not raise any important conceptual issues. The second one arises from the returns that may be demanded by other investors for assuming the risk of future spot price volatility -- that is, the risk premium. The third cost arises from any market failure. If the market is not using publicly available information efficiently, futures prices become biased predictors of future spot prices, entailing additional costs in using the markets.

A broader concept of market efficiency is necessary for understanding how and why markets develop and what effects their development has on the general economy. In this connection, we should keep firmly in mind the distinction between the 'efficiency' of a market (which says nothing about whether or not there is a failure in the workings of a market) and the 'operating efficiency' of a market (which indicates whether or not a market failure exists). A market that has a high level of efficiency (in the sense of being highly developed) may be operating inefficiently (that is, there may still be a market failure); and a rather rudimentary market (from the standpoint of the degree of its development) may be operating quite efficiently.

The efficiency of futures markets varies from one market to another as well as for a given market over time. Taken as a group, futures markets are perhaps the most efficient markets in the world. It is not clear, however, that futures markets are operating efficiently.

THE EFFICIENCY HYPOTHESIS :

An evaluation of the two types of costs, i.e., risk premium and market failure revolve around the issue of market efficiency. According to the efficient-market hypothesis, the expected excess rate of return to speculation in the futures market for commodities is zero. Since excess returns to futures speculation can be decomposed into two components -- the risk-premium component and the forecasting-error component -- a test of efficiency hypothesis can provide an indication of the costs due to one or both of these components.

The concept of efficiency as applied to commodity futures markets is no different from the concept as applied to any other asset market : the market is said to be (informationally) efficient if it uses all of the available information in setting futures prices. The intuitive idea behind this concept of efficiency is that investors process the information that is available to them and take positions in response to that information as well as to their specific preferences. The market aggregates all this diverse information and reflects it in the price. Formally, the market is said to be efficient with respect to some information set, ϕ, if futures prices would be unaffected by that information being revealed to all participants. Moreover, efficiency with respect to the information set ϕ implies that it is impossible to make economic profits by trading on the basis of ϕ. This notion of efficiency can be made empirically operational by noting that the expected excess returns to speculation in the futures markets should be zero. Excess returns v_{t+n} are defined by

$$v_{t+n} = [\ (f_{t+n}, T) - (f_t, T) \qquad \text{--------(1.2)}$$

where (f_{t+n}, T) denotes the log of the futures price at time $t + n$, for any given contract maturing at some time T ($T > t + n$). Similarly, (f_t, T) denotes for the same contract (maturing at time T) the futures price at time t. Since contracts of the same maturity are compared, in order to simplify the notation in the subsequent discussion we will denote (f_t, T) by f_t, (f_{t+n}, T) by f_{t+n}, and so on.

A necessary (but not sufficient) condition for an efficient futures market is that on average excess returns are equal to zero. Non-zero excess returns would imply that there is a systematic bias in futures prices, with prices at time t + n being on average higher or lower than prices at time t. However, the existence of a systematic bias, does not necessarily imply that investors behave irrationally or that investors can make economic profits by speculating in the futures markets . This can be seen by noting that the excess returns in equation (1.3) can be decomposed into two components -- one reflecting *forecast error* and one reflecting the *risk premium* :

$$v_{t+n} = f_{t+n} - f_t = [\, E_t (f_{t+n}) - f_t \,] + [\, f_{t+n} - E_t (f_{t+n}) \,] = RP_t + \mu_{t+n} . \qquad \text{-----(1.3)}$$

The first term on the right-hand-side [$E(f_{t+n}) - f_t$] is the risk premium RP_t . It is the difference between the expectation at time t of a contract's price at t + n and the contract's price at time t. If $RP_t > 0$, it implies that a hedger is selling a commodity by locking into a price that is lower than what may be expected to prevail in future, in order to have no price uncertainty. One way to interpret this term is to regard this as the compensation demand by risk averse-investors for taking over the risk of future price changes. The second term is the forecast error, μ_{t+n} . It is the difference between the actual price at time t+n and the price expected at time t to prevail at t+n. If investors' expectations are rational, the forecasting error would be zero. Clearly if RP_t is nonzero, v_{t+n} being nonzero does not imply that investors' expectations are not rational. Even more strongly, when $RP_t = 0$ (because investors are risk neutral, or because the sign of the risk premium changes over time with its average being zero), $\mu_{t+n} \neq 0$ does not necessarily that investors are irrational.

Fama[1] (1970) as an alternative to the above test proposed two levels of market efficiency : (i) the "weak form", which asserts that current prices fully reflect the information contained in a historical sequence of prices; thus, investors who rely on past price patterns cannot expect to receive any abnormal returns (this is the random-walk hypothesis); (ii) the "semistrong" form, which asserts that current

[1] E. Fama, "Efficient Capital Markets : A Review of Theory and Empirical Evidence", *Journal of Finance*, Vol. 25, 1970.

prices reflect not only historical price information but also publicly available information relevant to futures markets. If markets are efficient in this sense, then no publicly available information can yield abnormal returns; and (iii) the "strong" form of efficiency, which asserts that all information that is known to any investor, including privately held information, is reflected in market prices. Thus, no abnormal excess returns are possible.

Efficiency test as applied to the futures market exploit the proposition that if information is used efficiently and there is no risk premium, the excess returns from holding any futures contract for n periods (f_{t+n} - f_t) should not be correlated with information up to time t. This is because in such a case the excess return is just the forecasting error, and efficiency requires the forecasting error to be orthogonal to variables in the information set, I_t. In order to have a test with a sufficient power, the information set should contain elements that are a priori likely to be important determinants of the excess returns.

Finally, futures trading not only benefits the traders but also renders services to the farmers/cultivators. Hedging facilities would enable those farmers who grow commodity in very large quantities to hold on to their crops or stocks, spread out the sales of such stocks over a period and thereby realise a better average price for their products. A futures market provides to the farmer at the time of sowing an advance indication to the expected level of prices of different commodities during the marketing period, thereby enabling him to undertake proper crop planning.

Futures market helps exporters through its hedging facility. An exporter who enters into commitment with a foreign buyer has to deliver the goods at a later date at a fixed rate. Since it is not economical to or possible to buy and stock the goods in advance of delivery, fearing an adverse movement in the prices, he may insure himself by hedging in the futures market. The exporters, who are thus, assured of their normal profits are in a position to trade on a small margin of profit which, in turn, increases their competitive capacity in the world market. Futures markets, thus, help

to increase foreign exchange earnings by raising the exporter's competitive capacity, and can, therefore, be considered as one of the instruments of export promotion.

Thus, in the absence of futures market in appropriate commodities, the traders and manufacturers would attempt to cover their risks by attempting to charge a higher price to the consumers or to pay a lower price to the producers. In other words, the margin between what the producer receives and what the consumer pays would be widened. It is clear that futures trading , under suitable conditions, makes the return to the producers higher and the price to the consumers lower. In effect it reduces what is called the price spread.

However, Gilbert argues that the difficulty of hedging output on the futures markets is that it presumes that a sufficiently large set of contingency markets exist for each commodity. In practice few commodities possess a comprehensive set of such markets, and in many cases no contingency markets exists at all. In addition it is doubtful whether smaller producers in the smaller or indebted LDCs could ever secure the credit necessary to hold the positions they would need in those markets.

It must be realised that the positive gains available from the use of speculative price risk management (PRM) instruments are in the realm of possibilities and their actual realisation is contingent upon the fulfilment of a set of conditions, which make the commodity exchanges viable. According to an UNCTAD/World Bank study[1], a set of such conditions are as follows : (i) Adequate market liquidity from both speculators and hedgers to ensure that no one group or firm is dominant (which pre-supposes that "regional and rational risk management are large enough"). (ii) Terminal market facilities and infrastructures that are strategically placed and adequate for the delivery functions of futures contracts. (iii) Government oversight and regulatory activity that ensures market participants have independence of action to set market prices. (iv) The structure of industry must be such that there is a sufficient number of independent market participants.(v) The commodity traded must be homogenous to the extent that it allows itself to be divided into units that are fungible and interchangeable. (vi) There must be a free flow of information.

[1] As cited in K. Kabra, Chairman, "Report of the Committee on Forward Markets", Ministry of Civil Supplies, Govt. Of India, 1993.

(vii) Buyers and sellers must be able to enter the market with relative ease. and, (viii) The commodity traded must be storable and have a minimum degree of durability.

Having discussed the aspects of hedging vis-à-vis speculation, speculation in futures trading and its effect on price volatility, market efficiency and manipulation, we now go on to make a brief survey of the empirical evidence on the above mentioned facts about international futures markets in the next chapter.

CHAPTER : 2

A SURVEY OF SPECULATION AND COMMODITY FUTURES TRADING IN INTERNATIONAL MARKETS

I) PRICE VOLATILITY, STABILISATION PROGRAMME AND FUTURES TRADING :

An important characteristic of the 1970s and 1980s has been the large volatility of primary commodity prices. For instance, from 1971 to 1974, prices of food commodities (in SDRs) rose by over 100 percent, and then fell by 25 percent from 1974 to 1977. More recently, during 1983-86 prices of metals and minerals fell by 23 percent, then rose by 54 percent from 1986-88. The real commodity prices have been declining almost continuously since the early 1980s. Since their short-lived recovery in 1984, real commodity prices have fallen by about 45 percent. During 1992 the prices of commodities relative to those of manufactures reached their lowest levels in over 90 years. This instability in commodity prices has affected the export earnings of a large number of developing countries dependent on the export of a handful of commodities, or even a single commodity. The Asian experience is characterised by a marked shift toward the export of manufactures and strong increases in real export earnings; at the other extreme, Africa can be generally described as a situation in which continued reliance on primary commodity exports has resulted in a marked and persistent deterioration in real export earnings.

A number of emperical pointers emerged from a recent analysis of commodity prices by Reinhart and Wickham. First, the recent weakness in real commodity prices is primarily of a secular, persistent nature and is not the product of a large temporary deviation from trend which in turn suggests that a rebound in real commodity prices to their pre-1980s level, while possible, does not appear probable. Second, the relative importance of permanent shocks varies considerably across commodity

groupings : whereas permanent shocks account for only 30 per cent of the variance of metals price, they account for about 85 per cent of the variance of beverage prices. Third, the characteristics of the cycle also vary markedly across commodities. Shocks are the least persistent for metals and the most persistent for beverages. The previous two observations suggest that the scope for stabilisation policies is very commodity specific. Last, the volatility in commodity prices has risen steadily and considerably since the early 1970s, particularly for the once relatively stable food grouping.

These results are consistent with the picture that emerges from Table 2.1, borrowed from their article[1]. Several features are worth noting. First, the average price is markedly lower during the most recent sample, consistent with the presence of a negative trend. Second, there is a sustained and sharp increase in the variance of commodity prices, particularly, in the 'all commodities' and 'food groupings'. The coefficient of variation rises sharply as prices become more volatile around a falling mean; for food the increase in the coefficient of variation is sixfold. The coefficients of variation (based on a moving 15-year sample) for 1972-1993, also highlights the marked rise in volatility. Thus, Reinhart and Wickham notes, "not surprisingly, the sharpest increases in volatility appear to have taken place during the early 1970s following the breakdown of the Bretton Woods exchange system and on the heels of the first oil shock. However, volatility has remained high during the 1980s and 1990s. Structural models often link oil prices and the U.S. real exchange rate to real commodity prices. Hence, the changing structure of the oil industry since the early 1970s -- which has contributed to sharp increases in the volatility of oil prices -- and the switch to a floating exchange rate regime -- which has increased the volatility of other key relative prices such as real exchange rates -- are likely to be important factors in explaining the more volatile behaviour of commodity prices since the early 1970s".

To the extent that many developing countries are net importers of these commodities, their import bills have also fluctuated considerably. The fluctuations

[1] Carmen M. Reinhart and Peter Wickham, "Commodity Prices : Cyclical Weakness or Secular Decline?", *IMF Staff Papers*, June 1994.

Table No. 2.1

Descriptive Statistics, 1957-1993

Sample Period	1957-1969	1970-1979	1980-1993
Number of observation	52	40	54
	All Commodities		
Mean	4.714	4.705	4.386
Variance	0.001	0.017	0.031
Coefficient of Variation	0.789	2.806	4.036
Skewness	1.275	1.291	-0.061
Kurtosis	1.939	1.019	-1.386
	Beverages		
Mean	4.573	4.668	4.203
Variance	0.018	0.112	0.199
Coefficient of Variation	2.974	7.178	10.611
Skewness	1.152	0.979	-0.411
Kurtosis	0.083	0.396	-1.254
	Food		
Mean	4.766	4.789	4.341
Variance	0.002	0.042	0.053
Coefficient of Variation	0.839	4.280	5.300
Skewness	0.428	1.129	0.138
Kurtosis	-0.096	0.338	-1.526
	Metals		
Mean	4.819	4.677	4.412
Variance	0.008	0.016	0.024
Coefficient of Variation	1.868	2.737	3.490
Skewness	0.619	1.299	-0.250
Kurtosis	-0.280	1.638	-0.802

Source: Reinhart & Wickham, *IMF Staff Papers,* June 1994

have had a serious impact on their income and consumption, leading them to seek ways of reducing the fluctuations , or at least reducing their impact. At the macroeconomic level the impact on economic management can be reduced, for instance, by price stabilisation schemes. At the more disaggregated level the risks being faced by individual agents or group of agents can be reduced by using available market instruments. It is in the latter context that hedging via the futures markets can play an important role, which may also have important stabilising effects in the aggregate.

In a recent paper, Hallett shows how the distribution of a commodity producers' earnings would change under a price stabilisation programme or with production controls. "The stabilisation of primary commodity markets has been a major policy issue since the 1970s, partly because commodity prices themselves are so volatile and partly because the revenue from primary commodity exports are so important for generating foreign exchange, and employment in the less developed countries (LDCs). It is therefore vital to understand the effect of interventions designed to control price fluctuations or supplies to the market. Such control schemes have been tried often enough in the past, but they have not been conspicuously successful. First, the degree of dependence of the undiversified economies which rely on the revenues from one or two commodity markets is necessarily much higher than the dependence of a more diversified economy on its agricultural markets. Second, recent work has tended to emphasise the link between commodity market behaviour and macroeconomic performance --- in particular the interaction between commodity prices, inflation and exchange rates, not to mention the "Dutch Disease" phenomenon during commodity booms. Third, conventional macroeconomic policies can in principle be used to absorb most the volatility emanating from the asset and currency markets in a developed economy. But such policies can do rather little to offset the impact of fluctuations in commodity prices, and are likely to prove ineffective in a financially undiversified economy which is short of capital and development funds and therefore open to capital and foreign exchange movements. Private sector activity can easily offset conventional policy

changes, and the need to follow a coherent development strategy would normally leave very little room for policy manoeuvre anyway. In that case we have to rely on direct market interventions instead"[1].

Finally, it is not clear what the usual market stabilisation schemes can and cannot be expected to achieve. Indeed a major difficulty with the commodity stabilisation schemes has been confusion over what the proper objectives should be. The producers and international agencies tend to argue that the sheer volatility of prices is the main problem. On the other hand, since most of the commodity trade and processing lies in the hands of the developed economies, the LDCs have sought stabilisation agreements in which prices, *inter alia*, would be higher on average, or more stable, or would redistribute resources from consumers in the 'North' to producers in the 'South'. Alternative, and not necessarily incompatible, objectives are to stabilise producers revenues, to shorten periods with below average prices, to lessen the chances of large price disturbances, and to improve supply responses. This confusion over objectives is evident from statements such as : "Commodity prices should be stabilised at a remunerative level to become less vulnerable to market fluctuations" (Brandt, 1980), or that we need, "..... stable conditions in commodity trade, including avoidance of excess price fluctuations, at levels which would..... be remunerative..... to producers and equitable to consumers" (UNCTAD,1976)[2].

In recognition of the problems associated with price variability, various international stabilisation measures have been attempted with the objective of dampening price fluctuations. The Nairobi Resolution of UNCTAD in 1976 marked a new departure in commodity market policy with its emphasis on avoiding excessive price fluctuations and also export earnings from commodities. This combined policy prescriptions for stability in commodity prices with the aim of increasing commodity prices to improve developing economies' export earnings. The resolution covered many commodities and rested on the twin policies of funding buffer stocks

[1] A. J. Hughes Hallett, "Policy Options for Stabilising Earnings in a Speculative Market : A Structural Analysis", *World Development*, 1994.
[2] UNCTAD, *Integrated Programme for Commodities*, 1976.

(established in 1979 but still inactive) and providing finance for research and development.

From this it is not possible to tell exactly what policy makers intended to achieve, with their market stabilisation agreements --- except that they evidently hoped to get something of each of the objectives mentioned above. Since it seems improbable that they could achieve so much simply by stabilising prices or regulating quantities, Hallett tried to identify exactly what those intervention strategies can actually be expected to achieve. Hallett's simple probability model of the earnings distribution in a volatile commodity model has shown : (i) There will generally be a conflict between the two most frequently cited objectives of commodity and agricultural market stabilisation agreements, namely that to stabilise producers' revenue will lead to lower average revenues and vice versa. (ii) Both price stabilisation and supply controls will be needed if the conflict between stabilised and higher average earnings is to be resolved. In that way the chances of getting periods of low earnings (or large shocks to earnings) will also be reduced. (iii) Of these two strategies, price stabilisation is more effective (but not necessarily cheaper) but production controls from the point of view of stabilising earnings with favourable effects on the level of earnings, or of reducing the possibility of periods with low earnings and/or large disturbances to earnings.

Perceptions of the benefits of stabilisation through international commodity agreements (in particular buffer stocks) are now largely negative. This, together with a policy shift in developed market economies away from intervention and market-wide support schemes, has prompted a search for alternative means of stabilisation of prices and/or incomes. One possible choice is the use of commodity futures markets. Gemmell (1985) compared a buffer stock stabilisation scheme with forward contracts. Examining cocoa, coffee and sugar for 13 countries over 1961-78, he found that for sugar all countries would benefit by using forward contracts as opposed to a buffer stock scheme. For cocoa, three out of five countries would find forward contracting more cost effective than buffer stocks. But for coffee, however, the results did not favour either instrument.

Gilbert (1985) undertook a similar analysis using a multi-commodity, multi-country approach which evaluated futures trading and the benefits of stabilisation schemes under different scenarios particularly in the face of incomplete insurance markets. He concluded that costless hedging on an unbiased futures market implied that the benefits of a price stabilisation scheme would be zero or even negative. This was due to the individual agent being able to remove personal price risk completely and also because futures offer an insurance which is otherwise not available. Large producing nations could enjoy revenue stabilisation while smaller producers could achieve price stabilisation. The introduction of costs of using these markets would imply differing results and Gilbert concludes that if futures markets are to be accepted, or used, as alternatives to price stabilisation then LDCs' credit markets must be more efficient or must be established and supported by the world financial markets.

It is in this context that the potential usefulness of these financial markets like futures has grown in recent years. The markets for futures and for financial derivatives (like options) -- located in the main financial centres of developed countries --- have expanded rapidly over the past decade. There are, however, a number of reasons why most developing country exporters have so far found it difficult, or impossible, to use these markets. Maizels lists them in a recent article : "First, these financial instruments do not cover the whole range of internationally traded commodities. Those traded in different grades or varieties, or which cannot easily be stored, or are traded in insufficient volume, are generally not suitable for the use of futures contracts. Moreover, where there is a high degree of oligopoly pricing, oligopsony, or a high degree of vertical integration, it will generally not be practicable to develop exchanges based on futures contracts. Direct trading between producers and consumers may also obviate the need for futures or their derivatives. Second, where futures markets do exist, the costs to exporters in developing countries -- brokers' fees, margin calls, etc. -- may well discourage their use, particularly if the exporting country already has a chronic shortage of foreign exchange. A third limitation is that users of futures and derivative instruments need to be in continuous

touch with the relevant markets, which is extremely difficult for producers in most developing countries owing to poor communication facilities. Moreover, the trend away from state trading enterprises has resulted in the emergence of small-trading firms with little or no expertise in the use of financial markets, which adds to the difficulties arising from poor communications. Fourth, limitations often arise on the side of developed countries also if, for example, banks or trading houses in those countries have strict ceilings on exposure to perceived sovereign risk for particular developing countries. The possibility of market manipulation, causing market disruption and losses to certain market users, or the failure of some futures markets to provide reliable indicators of future price trends, may well be additional limiting factors. Finally, most financial contracts have relatively short maturities, futures and options being usually limited to one year, though some may operate up to two years, but these would not be suitable for commodities with long lags between investment and subsequent production."[1]

Thus, unless these impediments to the development of futures markets in developing countries are not addressed, the use of financial instruments to reduce market risks of exporting commodities from developing countries must be expected to grow rather slowly over the coming decades. Consequently, the existence of futures and derivatives should not be used an argument against the negotiation of new international commodity stabilisation agreements or the regeneration of old ones. Otherwise, commodity-exporting countries will continue to suffer from excessive export instability for a long time ahead, with adverse effects on their development potential.

Moreover, the alternative approaches of price-stabilising agreements and the use of futures and derivatives have quite different implications for the instabilities and uncertainties in the world economy as a whole. While the use of financial markets to hedge commodity risks would reduce the risks faced by individual traders, this by itself will not reduce commodity price instability which will continue to interact with, and may well accentuate, fluctuations in the financial markets, and thereby exacerbate

[1] Alfred Maizels, "The Continuing Commodity Crisis of Developing Countries", *World Development*, 1994.

the instability of the global economy. Nevertheless, if such conditions limiting the usefulness of futures trading in commodities can be largely tackled, futures trading will serve as an effective tool for price risk management, particularly, by individual agents.

II) RISK REDUCTION IN COMMODITY FUTURES MARKETS *:*

A precondition for effective risk reduction is the ability of the futures market to act as a predictor of the futures spot prices thus ensuring that the basis narrows as contracts reach maturity. This is described as the price discovery function of futures trading. Given the importance of price discovery, the first stage in any analysis of the effectiveness of futures trading requires an investigation into its ability to perform the price discovery function. If a futures market is performing its price discovery role efficiently, then any fluctuations in spot and futures prices should be positively correlated to reflect this flow of information. The hypothesis that the futures price is an unbiased prediction of a subsequent spot price has traditionally been tested (in its linear form) via the ordinary least squares (OLS) regression (sometimes with a correlation for serial correlation)

$$S_t = \alpha + \beta F_{t-i} + \varepsilon_t \qquad (2.1)$$

where S_t = spot (cash) price

F_{t-i} = lagged futures prices with *i* being the lag

t = time in months

ε_t = random disturbance

The unbiased hypothesis is that $\alpha = 0$ and $\beta = 1$.

Conceptually, efficiency in a commodities market will imply that spot and futures prices will not diverge from each other in the long run. If the series are both I(1), then the difference $S_t - F_{t-i} = u_t$ will be stationary or I(0) otherwise the spot and futures price will drift apart without bound (Granger, 1991). In general,

cointegration[1] between the spot and futures prices is necessary but not sufficient for efficiency. Given cointegration, efficiency requires that the long-run slope parameter be unity; that is, $\beta=1$.

Morgan, Rayner and Ennew[2] tested spot and futures prices in the four soft commodity market -- cocoa, coffee, sugar and wheat -- for cointegration. The spot price (S) series was the average price in the first week of the delivery month. Three separate futures price were used : F2, futures price lagged two months behind the spot price; F1, futures price lagged one month behind the spot price; FD, futures price in the first week of the delivery month. The sample period was March 1984 to December (October for sugar) 1993, giving 50 observations for cocoa, coffee and wheat and 39 observations for sugar.

Table 2.2, borrowed from their article, provides the basic statistics on the data. For cocoa and wheat, the spot price traded at a premium whilst for coffee and sugar the spot price traded at a discount. First, difference series generally showed a non-significant mean. Also, for all series, the unit root hypothesis was not rejected; all series were I(1) or non-stationary. Further, tests confirmed that the spot and futures prices within the same market were cointegrated. The null of no cointegration implied that the residual series from a cointegrating regression was I(1). In general, the null was rejected implying acceptance of cointegration, which is consistent with market efficiency.

Morgan, Ragner and Ennew also tested whether the cointegrating slope parameter was unity. Specifically defining

$$u_t = S_t - F_{t-i} \qquad (2.2)$$

the u_t series was tested for stationarity and rejection of the null hypothesis implies that S_t and F_{t-i} are cointegrated with a slope parameter of unity. For the F2 and F1

[1] The problem of non-stationarity of the spot and futures price series and thereby the inapplicability of the standard hypothesis tests to time series with unit roots is circumvented by testing for cointegration between the spot and futures prices.

[2] C. W. Morgan, A. J. Rayner and C. T. Ennew, "Price Instability and Commodity Futures Markets", *World Development*, 1994.

Table No. 2.2

Basic Statistics for Commodity Price Data

	Mean	St.Dev		Mean	St.Dev
Cocoa prices (Mar 84-Dec 93, 5 contracts, 50 observations)					
S	1793	517	ΔS	-25	200
F2	1553	500	ΔF2	-24	165
F1	1531	503	ΔF1	-28	132
FD	1540	485	ΔFD	-28	156
Cocoa prices (Mar 84-Dec 93, 5 contracts, 50 observations)					
S	108	47	ΔS	-1.8	19
F2	119	48	ΔF2	-1.6	28
F1	115	41	ΔF1	-1.5	18
FD	116	43	ΔFD	-1.5	21
Cocoa prices (Mar 84-Dec 93, 5 contracts, 50 observations)					
S	8.56	3.34	ΔS	0.106	1.75
F2	8.62	3.01	ΔF2	0.106	1.86
F1	8.67	2.98	ΔF1	0.106	1.71
FD	8.67	3.11	ΔFD	0.106	1.72
Cocoa prices (Mar 84-Dec 93, 5 contracts, 50 observations)					
S	348	56	ΔS	0.1	35
F2	332	52	ΔF2	-0.8	29
F1	332	50	ΔF1	0	35
FD	332	50	ΔFD	0.2	30

Source: Morgan, Rayner & Ennew, *World development*, 1994

series, the I(1) null hypothesis was generally rejected. For the FD series, however, the null hypothesis was only rejected for cocoa.

Within each of the four commodity markets examined, the results suggested that spot and futures prices were cointegrated and that in most cases, futures prices were unbiased predictors of spot prices in the sense that the cointegrating slope parameter was unity. These results support the notion that the commodity markets are efficient in the weak-form sense.

The foregoing tests focused on the long-run relationship between spot and futures price and indicated that for the four commodities, futures prices provided useful forward signals to agents. Firms using futures markets to diversify away the risk of spot markets fluctuation still face basis risk. The quality of a short-run hedge depends on basis variability relative to spot variability. Table 2.3, again borrowed from their article, presents information on standard deviations for the spot and basis for a number of recent contracts. In general, basis variability was much lower than spot variability except in the case of wheat. Although it is noticeable that some contracts are less satisfactory than others, the results indicated that futures trading in soft commodities can provide the opportunity for agents to reduce price risk via hedging.

III) EFFICIENCY IN COMMODITY FUTURES MARKETS :

The empirical evidence on risk and return in futures markets is ambiguous and makes it difficult to ascertain whether the there is an excess return to the speculators. Telser and Cootner debated vehemently in the 1960's as to the meaning of the data for corn, wheat, and cotton. Cootner maintained that an upward drift in futures prices was observable, thereby giving excess returns to the speculators who were long futures, while Telser argued it was not.

Empirically, the hypothesis of the efficiency of futures markets has been examined by a number of economists. Most of them imposed the condition of rational expectations to see whether excess returns in the futures markets reflected a risk

Table No. 2.3

Standard Deviation (Spot and Basis)

	Wheat		Coffee		Cocoa		Sugar	
	Spot	Basis	Spot	Basis	Spot	Basis	Spot	Basis
Dec-93	28.5	10.21			122.37	52.03		
Oct-93							0.057	0.3
Sep-93	14.63	17.29	6.53	1.19	95.01	48.76		
Jul-93	22.73	18	4.19	1.34	37.67	28.77	0.97	0.33
Mar-93	18.65	19.6	3.78	3.98	29.19	27.72	1.57	0.25
Mar-93	11.01	11.31	5.23	3.52	39.8	25.23	0.4	0.15
Jul-92	27.38	19.39	3.24	3.18	68.72	45.44	0.81	0.22
Jul-91	6.77	7.13	5.06	1.4	101.08	9.91	0.72	0.2
Jul-90	36.18	26.5	4.05	1.74	117.23	28.5	1.07	0.23
Jul-89	11.37	7.24	14.97	3.2	146.2	74.51	0.82	0.21
Jul-88	34.44	5.36	2.08	1.79	54.24	41.01	1.56	0.21

Source: Morgan, Rayner & Ennew, *World development*, 1994

premium. Since under rational expectations, the average forecasting error would be expected to be zero, nonzero returns would indeed reflect a risk premium. For example, Dusak[1] analysed the determinants of futures prices in the context of "capital asset pricing model" (CAPM). In this framework, returns on futures markets are governed by assets' contribution to the risk of a large and well-diversified portfolio. Dusak tested this model using bimonthly data for three commodities (wheat, corn, and soyabeans) for the 1952-67 period and found that the risk premium in these contracts was not significantly different from zero. To support her conclusions, she estimated the mean realised futures return and the systematic risk coefficient for each of the futures contract months of the three underlying commodities[2]. In her study, it was found that in only two of the sixteen cases reported, the mean realised return was significantly different from zero and in both cases the realised return was negative. These results were further corroborated by the estimates of the systematic risk coefficients. In only one of the sixteen cases was the beta (i.e., the measure of the risk) of the futures contract significantly different from zero. The lack of covariance of the futures returns with the market return was also observed.

In another study, Bodie and Rosansky (1980) found that if the Dusak sample was extended to a longer period (1950-76), the unconditional excess returns were significantly positive. More recently, Hazuka (1984) tested a consumption-oriented CAPM for several commodities (including corn, oats, sugar, wheat and metals such as copper and silver) that were classified according to storage characteristic. Only futures contracts with one month to expiration were used. Hazuka found that the risk premium involved in the future contracts was significantly different from zero, although the estimates of the coefficients in the model were different from their theoretical values.

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[1] K. Dusak, "Futures Trading and Investors Returns : An Investigation Of Commodity Market Risk Premiums", *Journal of Political Economy*, 1973.

[2] The systematic risk coefficients were estimated using the OLS regression,

$$R_{F,t} = \alpha_F + \beta_F (R_{M,t} - r_t) + \varepsilon_t$$

where the proxy for the market return, $R_{M,t}$, is the price appreciation on the S&P 500 stock portfolio, and the proxy for the riskless rate, r_t, is the return on a T-bill with fifteen days to maturity.

Both Dusak (1973) and Hazuka (1984) imposed the condition that the covariance of the return from holding a long position in the futures contracts and the return on market portfolio, or the covariance of the return and the marginal utility of consumption, was constant. To the extent that this is not so, their estimates of risk premia are not consistent.

As these studies indicate, the empirical evidence on efficiency in the commodity markets is diverse at best. The two components of efficiency[1] in futures markets --- the risk premium and the forecast error --- reflect directly the twin roles of futures markets. The first, related to the notion of risk premium, is that futures markets act as insurance markets allowing diversification of commodity price risk. The second function is akin to the forecasting role -- that is, futures prices provide forecasts of future spot prices.

Some preliminary evidence on the forecasting ability of futures prices can be obtained from Kaminsky and Kumar's article[2] where they tested whether the excess returns from holding a futures contract for n periods are, on average, equal to zero. Excess returns, $v_{t+n} = f_{t+n} - f_t$, as in equation (1.2), where f_t and f_{t+n} denote, respectively, the log of the futures price at time t and $t + n$. They tested whether futures prices are unbiased forecasts of future spot prices by testing the null hypothesis[3]

$$\mathbf{H_0 : E(v_{t+n}) = 0, \quad for \ n = 1,3,6,9,} \qquad \mathbf{(2.3)}$$

where n denotes number of months. The reason that testing the null hypothesis is equivalent to testing whether futures prices are unbiased predictors of spot prices

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[1] See Chapter I for efficiency of futures markets. Excess Returns, is given by the following equation,
$$v_{t+n} = f_{t+n} - f_t = [E_t (f_{t+n}) - f_t] + [f_{t+n} - E_t (f_{t+n})] = RP_t + \mu_{t+n}.$$

[2] Graciela Kaminsky and Manmohan S. Kumar, "Efficiency in Commodity Futures Markets", *IMF Staff Papers*, 1990.

[3] The reason that testing the null hypothesis is equivalent to testing whether futures prices are unbiased predictors of spot prices at the maturity of the contract is that futures prices at maturity, f_T, are equal to spot prices, s_T, by arbitrage.

atthe maturity of the contract is that futures prices at maturity, f_T, are equal to spot prices, s_T, by arbitrage.

Table 2.4, excerpted from their article presents the results of their above test for seven different commodities for the 13-year period 1976-88. It shows the mean excess returns from holding a futures contract for one, three, six and nine months (that is, a forecast horizon of one, three, six, and nine months), and the corresponding *t*-statistic for the test of the null hypothesis of unbiasedness. In the case of corn, for instance, for a forecast horizon of one month, the mean excess return was -0.0003, which is not significantly different from zero. Although mean excess returns were positive for some commodities such as cocoa and coffee, they were not statistically different from zero for any of the seven commodities, over any of the four forecast horizons.

The results in Table 2.4 suggest, at least superficially, that the null hypothesis of a zero bias in futures prices could not be rejected. However, the evidence was also consistent with the presence of a time-varying bias; that is, bias that may be positive during some years and negative in others, and has zero mean. Since there is evidence from other asset markets, such as the foreign exchange market, that a time-varying bias exists, Kaminsky and Kumar checked whether there is such a bias in the commodity futures markets.

To isolate any such bias they divided the sample into subperiods over which it was expected to display differential behaviour. The method of obtaining the subsamples was based on the evidence on investor expectations in the foreign exchange market. This evidence suggests that, in general, investors consistently underpredict the value of an asset when the asset is appreciating (for example, the dollar in the early 1980s) and systematically overpredict it when it is depreciating (as was the case after 1985 when the dollar started to depreciate). Following this type of evidence, the 1976-88 period was divided into subperiods according to whether the commodity spot price was increasing or falling. As it turned out, the results for futures markets were quite similar to those for other asset markets.

Table No.2.4

Tests of Unconditional Unbiasedness: Complete Sample

Commodity		Forecast horizon (months)	Excess returns (ft+1 - ft)	
			mean	t-statistic
Food	Corn	1	-0.003	-1.289
		3	-0.008	-1.372
		6	-0.014	-1.304
		9	-0.02	-1.34
	Soyabeans	1	-0.001	-0.281
		3	-0.002	-0.241
		6	-0.001	-0.117
		9	0	-0.029
	Wheat	1	-0.002	-1.129
		3	-0.006	-1.061
		6	-0.012	-1.069
		9	-0.017	-1.005
Beverages	Cocoa	1	0.001	0.479
		3	0.002	0.309
		6	0.003	0.15
		9	0.007	0.242
	Coffee	1	0.004	1.222
		3	0.013	1.344
		6	0.019	1
		9	0.032	1.1
Raw materials	Copper	1	0.001	0.317
		3	0.001	0.207
		6	-0.001	-0.117
		9	-0.006	-0.309
	Cotton	1	0.001	0.608
		3	0.002	0.326
		6	0.004	0.296
		9	0.008	0.445

Source: *Kaminsky & Kumar, IMF Staff Papers,* 1990

For illustrative purposes, Table 2.5 presents the results for two commodities. The results for wheat, the period March 1976 to December 1988 was divided into four subperiods: March 1976 to December 1976, December 1976 to January 1981, January 1981 to July 1986, and July 1986 to December 1988. During the third subperiod, the excess returns in the futures market were consistently negative for all four forecast horizons, indicating that futures prices overpredicted future spot prices. Conversely, during the last subperiod, excess returns had the opposite sign. In the case of cocoa (again with four different subperiods), during 1976-77 the excess returns were consistently positive, whereas over 1986-88 they were negative. For both commodities, the forecasting bias was generally significantly different from zero and was substantial in magnitude, reaching as much as 8 percent a year.

As in the foreign exchange market, the nature of the bias changes over time, and is, on average, positively correlated with the sign of the change in the commodity spot price. For example, during 1981-86 the price of wheat declined almost continuously, and realised excess returns during this period were negative. During 1986-88, when the price of wheat followed an upward trend, the excess returns in the futures market were consistently positive. In the case of cocoa during 1986-88, spot prices were expected to rise, but instead showed a downward trend with consistently negative excess returns.

Similar results[1], although not included here, were obtained by Kaminsky and Kumar for the other commodities for different subperiods. The authors qualify such results by noting that "this evidence of excess returns significantly different from zero does not necessarily imply market failure. There are two main reasons for these. The first has to do with the possibility that although expectations are rational *ex ante*, they may appear biased *ex post*. An explanation can be provided by a simple example in which investors use all the available information efficiently but still make nonzero forecast errors because the information is incomplete. A second reason why nonzero

[1] For example, during the early 1980s, when spot prices in the soybean and the corn markets showed a trend decline, excess returns in the futures market for both commodities were consistently negative. In some cases these excess returns were over 20 percent a year, such as for corn from January 1981 to October 1982, or 16 percent, in the case of soybeans from November 1980 to October 1982. A similar pattern was found in the other markets, although the results were less significant.

Table No. 2.5

Tests of Unconditional Unbiasedness: Selected Subsamples of Wheat and Cocoa

Commodity	Forecast horizons (months)	Sample Period	Excess returns (ft+1 - ft)	
			mean	t-statistics
Wheat	1	03/76-12/76	-0.02	-1.75
	3		-0.05	-1.86
	6		-0.08	-3.32
	9		-0.07	-2.11
	1	12/76-01/81	0	0.44
	3		0.01	0.58
	6		0	0.21
	9		0	0.04
	1	01/81-07/86	-0.01	-2.63
	3		-0.02	-3.41
	6		-0.04	-3.86
	9		-0.05	-3.95
	1	07/86-12/88	0.01	1.16
	3		0.02	2.44
	6		0.04	3.39
	9		0.05	2.37
Cocoa	1	03/76-03/77	0.04	4.27
	3		0.12	9.81
	6		0.22	9.31
	9		0.29	7.7
	1	03/77-08/82	0.01	-0.53
	3		0.04	-0.51
	6		0.07	-0.51
	9		0.13	-0.06
	1	08/82-01/84	0.01	1.08
	3		0.01	0.87
	6		0.01	0.36
	9		0	0.01
	1	01/86-1288	-0.01	-1.82
	3		-0.03	-2.95
	6		-0.05	-3.75
	9		-0.07	-3.53

Source: *Kaminsky & Kumar, IMF Staff Papers,* 1990

excess returns do not imply market failure is the existence of a nonzero time varying risk premium".[1]

Earlier it was shown that the excess returns in futures markets can be decomposed into a forecast error, μ_{t+n}, and a risk premium, RP_t. Conditional on the assumption of a zero forecast error, a nonzero excess return could simply be interpreted as evidence of a nonzero risk premium -- indicating that investors are risk averse. Modern theories of asset pricing suggest that the risk premium separating futures prices in a given period from future prices in subsequent period will vary through time in proportion to the movements in the covariance of the returns of future contracts and consumption. Since this conditional covariance may change signs, no bias need be found over a large time interval, even though over any given time period the expected excess return may be different from zero.

Another approach has been to analyse the time-series pattern of futures prices to see if any dependence exists that may be exploited for profit In the stock market Fama[2] (1970) has dubbed such tests "weak form" tests of market efficiency since they seek to determine whether a "weak" information set -- the past sequence of prices can predict future price changes. If the market is efficient, the futures price at t reflects all available information at that point, including the past history of prices. The past history of prices therefore cannot be used to generate a positive profit in the period t to t+1. A simple emperical implication of efficiency markets is that today's futures return should not be correlated with tomorrow's futures return, i.e., $\rho(R_t, R_{t+1}) = 0$. Several investigators like Smidt (1965) and Stevenson and Bear (1970) found that serial correlation is not economically significant. When serial dependence is observed, it is not large enough to overcome the transaction costs incurred in trying to profit from it.

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[1] Graciela Kaminsky and Manmohan S. Kumar, "Efficiency in Commodity Futures Markets", *IMF Staff Papers*, 1990.

[2] Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work" Journal of Finance, 1970.

Taking a clue from Fama, Kaminsky and Kumar carried the *'weak test'* of efficiency based on the following equation, which indicates excess returns in a given market as a function of a constant and three lagged excess returns :

$$f_{t+n} - f_t = \beta_0 + \sum_{m=1}^{3} \beta_m (f_{t-m+1} - f_{t-n-m+1}) + \epsilon_{t+n}, \qquad (2.4)$$

The results from their analysis indicated that the strongest evidence against the joint hypothesis of no market failure and zero risk premium occurred in the cocoa and the copper markets at the three - and six- month forecast horizon, respectively. For wheat and coffee also, the null hypothesis for the nine-month forecast horizon could be rejected at better than 10 percent level of significance. But for other maturities for wheat and coffee, and for other commodities, there was no strong evidence against the null hypothesis. In other words, for three of the seven commodities, namely corn, soyabeans, and cotton, the futures market could not be said to be inefficient in the weak form. For the other four commodities, however, the null hypothesis of efficiency appeared rejected for some of the forecast horizons at the conventional levels of significance.

Since the above test may not have enough power because it uses data only from the "own" market, the *'semistrong efficiency'* test was also undertaken by the authors. The results of the own forecast error and the six other commodities' lagged forecast errors, is indicated by the following equation :

$$f^j_{t+n} - f^j_t = \beta_0 + \sum_{l=1}^{7} \beta_e (f^l_t - f^l_{t-n}) + \epsilon^j_{t+n}, \qquad (2.5)$$

where the superscript j refers to commodity j.

Intuitively, the use of past price information concerning other commodity markets, in addition to the own price information, should make it easier to earn excess returns, compared to using the commodity's own price history only. This is so, since presumably, futures prices in other markets yield information that will

complement or supplement the information from a commodity's past history. Contrary to the results in the weak test conducted by Kaminsky and Kumar, the null hypothesis that all the coefficients are zero was rejected for six out of the seven commodities for the six-month and nine-month horizons, at 5 percent level of significance or lower. However, for the one- month horizon, the null hypothesis could not be rejected for any of the commodities, and for the three-month horizon, it was rejected for four out of the seven commodities. Given that this multicommodity test is more powerful, the results do suggested that for short horizons the *joint hypothesis* of zero risk premium and no market failure could not be rejected. However, for longer horizons these results could not be regarded as fairly strong evidence against the efficiency of these futures markets, especially since the results were based on a 13-year period.

These conclusions were further corroborated by the final test of efficiency performed by Kaminsky and Kumar. The basis for such a test was as follows : "In testing for nonzero expected real profits using the semistrong test, a regression was run with the excess returns on the left-hand side, and variables in the publicly available information set on the right-hand side. As in the literature on efficient markets, it is assumed that that if the information was in the public domain then it was available to the public and should have been reflected in prices. Of course, this assumption ignores the cost of acquiring the information, but the justification for this position is that the costs of acquiring such public information are small compared to the potential rewards. In principle, any variable in such an information set is a candidate in the regression equation. However, to improve the power of the test, those variables should be included which are more closely related with , for example, the risk premia in these markets"[1]. In the following test the authors included different macroeconomic variables for the United States, such as the growth rate of consumption, the terms of trade, the inflation rate, the growth rate of industrial production, the growth rate of money supply and the riskless interest rate as measured by the treasury bill yield, as well as the own lagged forecast error. These

[1] Graciela Kaminsky and Manmohan S. Kumar, "Efficiency in Commodity Futures Markets", *IMF Staff Papers*, 1990.

chosen variables should affect investment and consumption decisions and possibly, therefore, rates of return in the asset markets.

For the above test, the following equation was estimated :

$$f^{j}_{t+n} - f^{j}_{t} = \beta_0 + \beta_1 (f^{j}_{t} - f^{j}_{t-n}) + \sum_{l=1}^{6} \gamma_l X^{l}_{t} + \epsilon^{j}_{t+n} \qquad (2.6)$$

where x^l denotes the six macro variables noted above. The results rejected the efficiency hypothesis for only two commodities (cocoa and cotton) for the one-month forecast horizon, and three commodities (cocoa, cotton, and coffee) for the three-month horizon. However, for the six- and nine-month horizons, the null hypothesis was rejected for most commodities. For instance, for the nine-month horizon the null hypothesis was rejected at a very low level of significance for all commodities except cotton.

The above results indicate that it is not possible to make any strong generalisation about the efficiency of the commodity futures market for short-term forecast horizons. For longer periods, however, it does appear that several of the markets may not be fully efficient. Of course, even in these latter cases, the emperical rejection of the efficiency hypothesis does not imply market failure. In particular, if investors are risk averse, a nonzero excess return may only reflect a time-varying risk premium.

Another approach to testing the efficiency of commodity futures markets is to examine the subgroups of investors, such as professional traders and investment advisers, to see if they can earn abnormal returns. What is a normal return now requires discussion. It is unlikely that the normal return of professional traders and advisers is zero; for if it were, how would they feed their families ? One would expect professional investors, those who spend time and resources in analysis, to generate positive trading profits or to charge fees. The findings by Rockwell (1967) and Houthakker (1957) where returns to various groups of traders were estimated by using their open position and price change data, are consistent with efficient markets. Their study examine returns to large hedgers, large speculators and to small traders in physical futures markets. These studies conclude that large speculators do make a

profit, which is consistent with the idea that professional speculators should make a profit. The studies disagree on whether other speculators make or lose money. Under the null hypothesis of zero expected returns to speculators, gains by one group of speculators should be offset by losses of the remaining speculators. Rockwell argues this is the case. Houthakker argues that small speculators also makes money, thereby rejecting the null hypothesis.

Summing up, while in general futures markets are efficient in the "weak" sense the same cannot be said to be true about the "semi-strong" or the "strong" forms of efficiency. While in the short term the expected returns may be zero due to the speculators as a "group" earning normal returns; in the longer term horizon, however, there is a case for the speculators to earn abnormal profit. This is particularly so because the prevalence of the professional speculators among the group of speculators who demand more than proportionate returns with increasing risks, yields returns which are significantly different from zero.

IV) PRICE EFFECTS OF SPECULATION :

This section is concerned with the price effects of speculation through the relationship between the volume of trading and extent of price variability on commodity futures market. The existence of such a relationship has been documented in several places although there is less than unanimous agreement as to the underline mechanism by which it is generated. Such a study is important since it bears directly on the question of price effects of speculation and, hence, on certain aspects of market regulation. It is observed that day to day variation of trading volume in fact, is related to day to day variations in speculation. This is because transaction involving hedgers on either side comprise only small proportion of daily trading volume.

Current statistics to support this claim are not available, but a review of the fragmentary historical data, summarised in Table 2.6, provides an indication of orders of the magnitude involved. The relevant figures are those related to trading on the Chicago Board of Trade. The time periods covered in Table 2.6, are somewhat

atypical, being periods of unusually wide price movements. Even if the figures in the table considerably underestimate the usual volume of hedging transactions, however, it remains clear that, movements in daily trading volume primarily reflect movement in speculative activity.

The balance of participants is different from market to market. Some markets, such as the London Metal Exchange, the IPE and the white sugar markets of London and Paris, are heavily dominated by commercial interests, who undertake both hedging and speculative trading. Others, for example most of the exchanges in the US, Japan and all gold and silver markets are dominated by non-commercial interests, many being speculators.

Within the group of speculators, the role of locals vis-à-vis that of investment funds is different from market to market, and also from one period to another. In the United Kingdom and France, there is no reporting on the importance of the market participants by different groups. In the United States, buyers and sellers of futures contracts on the commodity exchanges are divided for regulatory purposes between those who have an interest in the physical trade of the commodity concerned and those that do not. the first are called "***commercial interests***" or "***hedgers***", the second "***non-commercial interests***" or "***speculators***". While figures based on this classification are the only ones available, the nomenclature is misleading. While those users who have a commercial interest in the underlying commodity are often hedging their price risks,

Table 2.6: Percentages of Trading Volume Involving Hedgers

Period	Exchanges	Commodity	Hedging Transactions as Percentage of Total Volume
2 Jan, 1925	Chicago Board of	Wheat	3
18 Apr, 1925	Trade	Corn	
3 Jan, 1927	Chicago Board of Trade	Wheat	5
31 Oct., 1927	Chicago Board of Trade	Corn	4
	Chicago Board of Trade	Wheat	23
	Minneapolis Grain Exchange	Wheat	26
	Kansas City Board of Trade	Wheat	45
	Duluth Grain Exchange	Corn	15
18 Sep., 1947	Kansas City Board of Trade	Wheat	15
	Chicago Board Trade		

Source : Barry A. Goss, (ed.), "*Futures Markets : Their Establishment and Performance*" , Croom Helm, 1986.

they also speculate on a fairly large scale. Those who do not have a commercial interest may be speculators or may be firms representing clients who are speculators or hedgers; or they may be market makers, arbitraging futures positions.

In terms of transaction volume, figures on participation are difficult to obtain because many positions are opened and closed the same day. Table 2.7 shows the distribution of ***open interest*** (the remaining open positions at the end of the day) between "non-commercial" and "commercial" interests for a number of US markets on 13 March 1992; non-reportable positions to a large degree refer to small scale speculators.

As can be seen, non-commercial interests, together with those holding non-reportable positions, account for a significant share in all markets. Figures of the New York Cotton Exchange support the argument that these overall figures are misleading, as mentioned above. NYCE figures separate out "house" transactions from transactions on behalf of customers for both groups of large participants, those defined as "non-commercial" and those defined as "commercial". It is noticeable that for both groups, a large part of transactions is on behalf of customers. For example, for the cotton contract, 27 March, 1992, speculators account for 36 percent of the total reportable positions; of these, one-third was on behalf of customers -- who may be legitimate hedgers. Commercial interests accounted 64 percent, of which half was on behalf of customers -- again, there is no way of saying whether these customers were, for instance, managed funds or those involved in executable orders.

Locals -- small individual traders -- are usually only active in one commodity and provide a major part of intra-day activity, sometimes as much as 40 percent. They rarely leave their positions open overnight. Although their operations can be criticised, their profits only account for a vary minor part of exchange transactions value. In recent years, there has been a concentration of market power among trade houses. Some major players have disappeared, and a limited number of very large international multi-commodity trade houses now dominate commodity trade and have a major share in commodity futures turnover. Concentration is especially high in trade in soft commodities, but it has also grown in the metal trade. While their large role on

TABLE : 2.7

Distribution of open interest for a number of US markets, 13 March, 1992.

(percentage of total short or long positions in a contract)

Contract	Non-commercial interests		Commercial interests		Non-reportable positions	
	long	short	long	short	long	short
CSCE						
Sugar No 11	9.4	15.8	67.1	62.7	23.2	21.2
Sugar No 14	-	-	70.6	74.8	29.4	25.2
Coffee C	18.9	9.7	44.9	71.5	31.9	14.6
Cocoa	15.7	14.3	60.7	70.2	20.6	12.4
NYMEX						
Light sweet crude oil	3.0	4.4	69.2	67.0	23.3	24.2
COMEX						
Copper	17.0	4.7	45.1	68.5	36.8	25.7
Silver	28.1	6.9	31.5	75.7	35.6	12.6
Gold	10.3	23.1	54.8	42.6	25.6	25.0
NYCE						
Cotton No 2.	7.8	23.5	59.0	42.1	29.6	30.9
FCOJ	7.7	16.8	66.1	49.0	21.4	29.5

Source : *Commodity Futures Trading Commission*, "Commitment of Traders in Futures", 13 March, 1992.

excchanges can be partially attributed to an expansion in the types of physical trade contracts which make the trade house the intermediary for the risk management activities of its trade partners, trade houses are also active for their own account. A few have even created their own managed funds.

There are different types of non-trade related large speculators . The most important are the investment funds, of which there are two sorts : managed funds and institutional investors. Especially in the U.S., the market share of large private investors is also not negligible. In a sampling by C.F.T.C. of its large trader reports in late 1983, it was found that out of a total of around 1400 accounts with reportable large positions in 13 futures markets, more than one quarter was in the hands of large individual speculators.

Managed funds consist of funds put together by individuals or institutions with the purpose of undertaking futures market operations. They are run by professional money managers. Experience has shown that all but the largest private speculators are forced out of the market before long, whole the staying power and diversification possibilities which result from having assembled the funds of a number of smaller speculators allow longer survival and even profits. In the US, where managed funds are most developed, over 1000 funds are active in futures markets. Of these, a small number account for the major part of investments : in 1988, 41 commodity funds and pools, managing between US$10 million and 1 billion, accounted for 80 percent of the net assets of all managed funds. In a 1988-89 survey,[1] it was found that commodity funds and pools accounted on average for 1 to 6 percent of volume as well as open interest in medium-sized and large US commodity futures markets in the United States. Since then, with the further growth of managed funds, their share has possibly increased.

Institutional investors are mainly pension and insurance funds which consider the use of commodity futures markets as a way to improve the composition of their

[1] *Commodity Futures Trading Commission, Division for Economic Analysis*, "Survey of Commodity Pool Operators in Futures Markets with an Analysis of Interday Position Changes", January, 1991.

investment portfolio. Since the late 1980s they are gradually diversifying into instruments such as futures and options contracts.

There are a few firms specialised in arbitrage transactions, especially in the arbitrage between futures and options. The proportion of arbitrage transactions in daily turnover is very high. Arbitrage is a low risk activity and so these firms leave a large part of their positions open overnight. They may account for as much as one quarter of open position interest on some markets. Current reporting system do not allow a proper evaluation of their role.

Widespread agreement can be found among even the most casual students of futures markets that these markets facilitate speculation. There is considerable disagreement, however, as to the effects of such speculation. One school of thoughts holds that speculation performs a welfare-increasing function which is effected in a variety of independent ways. First, speculation is required for a futures market to grow to sufficient maturity to facilitate hedging operations. Thus, in so far as futures trading itself produces benefits, these may, at least in part, be attributed to speculation. Benefits of this kind include generation of increased traders' information about supply and demand influences, facilitation of transactions among strangers and facilitation of risk-management by handlers of commodities.

A further strand of argument is that speculation promotes price stability. By providing an inter-temporal array of price information, a futures market (and, hence, speculation) enables stock-holding, production, consumption and processing activities to be allocated over time in an efficient fashion, therefore reducing the amplitude of seasonal fluctuations in *cash prices.* At the same time, according to this view, speculation has the effect of mitigating short-run fluctuation in futures prices. The notion is that speculators buy futures when prices drift 'too low' and sell when they go 'too high'. In each case, the extent of futures price variability is reduced. This latter view, stated in the form that profitable speculation necessarily exerts a stabilising influence on price, has been associated with Friedman (1953), although it can be traced back at least as far as Irving Fisher (1930). As we shall see below, it has given rise to a protracted theoretical debate among economists.

On the other hand is the view, sometimes expressed before congressional hearings, that speculation has a destabilising influence on price and, in particular, that 'waves' of speculative activity motivated by factors unrelated to fundamental market influences may distort prices and cause them to fluctuate to an unwarranted degree. This view prevailed in 1958 when trading in onion futures was prohibited in United States, and it lay behind at least some of the criticism of futures trading which led to extensive amendments to the Commodity Exchange Act in 1974.

The gist of this view was expressed clearly enough by Congressman Conte : "Both producers and consumers have suffered as a result of huge price fluctuation. I am convinced that someone, somewhere is profiting from all of this. And I suspect that in some cases at least, the people responsible for the price fluctuations are among those benefiting from them."(US 93rd Congress, 1957).

Furthermore, the view that speculation may exacerbate future price movements has been accepted by some close observers of the market place. The then administrator of the Commodity Exchange Authority, R.R. Kauffman, commented in 1957 on speculation in the onion market as follows:

"Wide and rapid price swings attracts speculation which at times further widens the swings, thus attracting more speculation. This speculating fever continues until the individual speculators have either lost their money or made enough to satisfy for the time being." (US 85th Congress, 1957).

Congress has seen some merit in this argument as the Commodity Futures Trading Act, of 1974 states, in part :

"Excessive speculation in any commodity under contracts of sale of such commodity for future delivery made on or subject to the rule of contract markets causing sudden or unreasonable fluctuations or unwarranted changes in the price of such commodity, is an undue or unnecessary burden on interstate commerce in such commodity. For the purpose of diminishing, eliminating, or preventing such burden, the Commission shall, from time to time, after due notice and opportunity for hearing, by order, proclaim and fix such limits on the amount of trading which may be done on positions which may be held by any person under contracts of sale of such commodity for

future delivery on or subject to the roles of any contract market as the commission finds are necessary to diminish , eliminate or prevent such burden." (US 93rd Congress, 1974)

Baumol (1957) , Stein (1961) and Kemp (1973) have shown that it is possible to construct models in which speculation is profitable yet destabilising. Baumol's illustration of these proposition have been criticised by Telser (1959) as being unrealistic, while Stein's example rests on institutional characteristics of the foreign exchange market which may not be relevant for the present case. Nevertheless, works by Farell (1966) and Schimmler (1973) suggests that the formal conditions under which the proposition that 'single profitable speculation is price stabilising' is valid are quite restrictive. It is difficult not to agree with Baumol that 'the effect of speculation on stability is in part an emperical question and that attempts to settle by a *priori* comments must somewhere resort to fallacy' (Baumol, 1957).

In most commodity futures markets, the role of investment funds is increasing. The large majority of investment fund activity is concentrated in the nearby futures contracts, with most of the remainder in the next maturity. They are hardly active in the further away contract months. However, it is likely to reduce sharply when they start profiting more from the spreads between different contract months. The size of the individual funds is generally very large compared to the turnover on, in particular, agricultural futures markets, and only the nearby futures contracts provide a volume in which they find easier to trade.

Investment funds easily shift between financial markets and commodity futures markets. Because of their size, this shifting can have a major influence on prices. The activities of many investment funds have therefore upset many hedgers. For instance, "many of Chicago's traditional agricultural traders say that they are worried about the widening parameters of risk exposure in their markets pumped up on money from out-of-favour financial instrument markets."[1] Developments in the underlying physical market may become of secondary importance. In 1987,

[1] *World Commodity Review*, 27 July, 1988.

"Chicago's agricultural futures markets were caught in a downslide....as traders were forced to liquidate positions to cover losses in financial futures. .... Some of the big brokerage houses had pulled their traders out of the agricultural pits as they were forced to raise margins in the financial markets."[1] The same happened in late 1987, when LME metal prices increased unexpectedly. "Merchants ...blamed the rapid price movements in the futures markets on speculators, who apparently took their money out of equities when Iraq invaded Kuwait, and investment in commodities."[2]

A related problem is that a large majority (80-85 percent) of investment funds use technical systems as a basis for their investment decisions. The most important systems used are trend-following, with many fund managers accepting the systems' signals almost without question, ignoring the market's fundamentals. All trend-following systems are quite similar, and certain "trigger signals" may cause a massive run into or out of the market. A commodity price decline which would trigger sales by one investment fund would be reinforced by this fund's sales, and thus trigger sales by others. This snowball effect is much feared by commercial interests. It should be noted, however, that the effects in most cases are short-lived, and negative consequences can be avoided by well informed trade users. Also, this behaviour of investment funds may offer additional profit opportunities to hedgers and floor traders alike. Occasionally, however, a more prolonged markets anomaly may arise, as in the case of the prolonged decline of coffee prices in 1992 (from 70 cts/lb in March to 49 cts/lb in early August), reinforced by investment fund activity -- the selling of futures contracts which induced further sales. This was followed by a strong increase (from 48 cts/lb in late August to 84 cts/lb in late December) in which funds played an equally important role. Traders reacted to the price decline by raising premiums for the coffees they had in stock. This shows the extent to which the markets had lost its role as price reference mechanism. Producers were unable to claim such premium increases, and received only the standard reference prices determined on the futures market. Nevertheless, if futures market volatility is high,

[1] *Financial Times*, 30 October, 1987.
[2] *Metal Bulletin*, 6 September, 1990.

the result of a hedging transaction may be the opposite of that intended, especially for a less well-informed hedger.

Empirical resolution of whether speculators as a group are responsible for price instability is no easy matter, however. The course of action usually adopted is to examine the variability of cash prices of a given commodity for two time periods, one in which an active futures market for the commodity existed and one in which there was no such market. In order to attribute any observed differences in price variability to the influence of futures trading or speculation, one must resort to a *post hoc ergo proctor hoc* argument and consequently the results of such studies must be interpreted with caution. Analysis along these lines has been undertaken for wheat (Tomek, 1971), onions (Gray,1963; Johnson, 1973; Working, 1960), cotton (Chapman and Knoop, 1906), porkbellies and live cattle (Powers, 1970; Taylor and Leuthold, 1974). These studies generally show a reduction in price variability concomitant with futures trading.

Rutledge in an article examines the question from a somewhat different viewpoint. The correlation between trading volume and price variability might be construed as evidence in support of the hypothesis that speculation destabilises price. On the other hand, it is not difficult to envisage models of speculative behaviour in which an increase in the volume of trading can be considered as a *response* to, rather than a *cause* of , increased price variability. This view is consistent with the activities of scalpers and day traders as described by Workings (1977, 1967). If prices are regarded as promptly and appropriately reflecting new information which flows to the market place at an uneven rate, then the trading activities of scalpers will clearly be greater on days when prices fluctuate more. The same conclusion seem to apply to 'day traders', whose activities have been described in more details by Working (1977). Another important class of speculative trading is 'price level trading'. Here again the greater the degree of price fluctuation the more likely it is that potentially profitable short-run trends may emerge, giving rise to increased trading activity.

It is in this context that Rutledge remarks : "Much importance, therefore, attaches to the *direction of causality* underlying the correlation between trading

volume and price variability. Evidence that causality runs from trading volume to price variability would strongly support the critics of futures market and would provide a more satisfactory base on which regulations of speculative positions and daily trading activity could be based. Evidence in the other direction, when combined with that described above on cash price variability, would provide empirical support for those who argue for some modifications of these regulations.

It should be remembered that when we speak of trading volume 'causing' price instability, or price variability 'causing' trading volume we are in fact glossing over a very complex mechanism. In fact, of course, the observed relationship between these variables is a reflection of the extent to which traders react differently to perceived new information. The truly 'causal' variables cannot be observed and hence our portrayal of the relationship between trading volume and price variability as a causal one is a very crude characterisation of the micro structure of futures markets."[1]

The concept of causality employed by Rutledge rests on two intuitive notions. First, that the future cannot cause the past and, second, that causality must essentially be a probabilistic concept. Rutledge applied the Granger-Sims procedure to daily data on trading volume and price variability for a number of commodity futures contracts. The measure of price variability employed was the absolute value of the percentage change in daily closing price. The data base initially constructed consisted of daily closing prices and daily trading volume for 15 commodities. For each commodity, three time periods of approximately four months length were selected. These sample periods were selected to enable comparison to be made between several delivery months.

In each estimated equation, a time trend was included to allow for any long run influences not directly accounted for in the relationship between trading volume and price variability and all equations was estimated using the Cochrane - Orcutt iterative procedure to take account of first order serial dependence in the errors.

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[1] D. J. S. Rutledge, "Trading Volume and Price Variability : New Evidence on the Price Effects of Speculation", in B. A. Goss (Eds.), *Futures Markets : Their Establishment & Performance*, Croom Helm, London & Sydney, 1986.

In all, 136 contracts in 13 commodities were retained for analysis. The results provide remarkable strong supports for the hypothesis that movements in trading volume represents a response, rather than a cause of, movements in price variability. Of the 136 contracts examined, 23 exhibited so weak a relationship between trading volume and price variability that the question of causality did not arise. Sixteen of these (in the soyabean complex , silver and IMM contracts) were commodities where spreading activities are particularly important and where, as a consequence, one would expect a simple relationship between trading volume and price variability to be less prevalent. Most of the other contracts falling into this category are in commodities where futures trading was a relatively recent phenomenon .

In 80 of the remaining 113 cases, the procedure was unable to identify the direction of causality between trading volume and price variability. Rutledge[1] explains such a result : "This is almost certainly a reflection, not of the lack of causal relationship, but rather of the period between observations being too great relative to the time lags involved. A very great proportion of variation in trading volume is a reflection of the activities of day traders who hold zero positions overnight. Even if the trading of this group is significantly influenced by price variability, we should not expect to find many lagged responses greater than one day in length."

Most importantly, of the 33 cases in which the procedure does identify the direction of causality, only two showed causality running from trading volume to price variability. In all other cases, the evidence supported the hypothesis that trading volume responds to price variability rather than causes it.

This empirical evidence while it does not provide direct evidence that speculative activity stabilises prices in the short run, it clearly forms the basis for rejecting the alternative view that speculative activity destabilises prices.

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[1] D. J. S. Rutledge, "Trading Volume and Price Variability : New Evidence on the Price Effects of Speculation", in B. A. Goss (Eds.), *Futures Markets : Their Establishment & Performance*, Croom Helm, London & Sydney, 1986.

VI) MANIPULATION :

Most manipulation attempts involve simultaneous transactions on the futures and on the physical market; it is therefore trade-related actors (and in particular trade houses) who are best placed to try to manipulate a market. Recently, however, investments funds are said to have tried to manipulate some contracts. While markets with limited liquidity are particularly vulnerable to manipulation attempts, even the world's largest markets can be the target of manipulation under certain circumstances. Historically, hedgers and not speculators, have been responsible for big squeezes and other market manipulations. One only has to recall the famous Bunker Hunt efforts in the early 1980s to try to squeeze the world silver market, which followed his earlier squeeze attempt of the world soyabean market, even though both of these markets were among the most actively traded of any commodity futures.

Manipulation is possible whenever one entity acquires excessive control over demand or supply - or a certain key small proportion of supply, if quality and delivery specifications are too narrow - in the crucial period in which delivery is specified. In successful examples of manipulation, other suppliers or users cannot respond quickly enough to deliver or receive quantities in the specified location within the specified time. The ease with which a market for commodity futures can be manipulated depends partially upon the delivery terms specified for that futures market. The more restrictive are the limitations upon the acceptable grades, origins, delivery points and alternative delivery procedures, the tighter are the delivery times and the shorter is the period of notice that has to be given for delivery to occur at the expiry of the contract, the easier it becomes for an individual entity or a group to manipulate the market.

In the short run, manipulation is in general not bad for producers. Most attempts are squeezes which result in higher prices. Note that in all instances in which developing countries exporters have tried to push up prices by way of interventions

on the futures markets, prices did go up, but not to the extent desired, and these efforts have been very costly for the countries involved. It is reported that Malaysia lost some 20 million pounds when it tried to push up tin prices in 1981/82. In 1977, three companies from El Salvador and Brazil obtained three quarters of the open positions of the December coffee contracts, but were forced to close out their positions, at a loss, by the CFTC. From 1978 to 1980, a group of Latin American coffee producers, the Bogota Group, later organized into a corporation called Pancafe, was operating on futures markets in New York and London, in an attempt to influence prices. Again, CFTC strongly interfered in its operation, and while the Bogota Group had profits for a short period, it soon began to have problems, and the scheme was given up in the mid-1980s. Nevertheless, manipulation has several undoubtedly harmful repercussions. It creates a new source of uncertainty and risk. It reduces faith in the objectivity of the price that is determined on the market, and which is often used as the basis for much of world market trade.[1] Finally, because the leading futures markets are located in a few developed market economies and most contracts (with the exception of sugar, palm oil and rubber) are specify delivery in those countries, institutions based there have better access to the markets than others and are better placed to manipulate the price.

It is often difficult to determine what is manipulation and what is not. According to a board member of the LME , "there is a narrow dividing line between freedom and excess and from time to time people take advantage and manipulate the market . This has happened to all the metals in the past three years."[2] The same is true of the fuels and soft commodity markets. In many cases, a company has more or less accidentally built up a position of strength and profit from this. This often takes place in the period just before the closure of a contract, and consists of game playing with deliverable qualities. For instance, in the sugar market, a threat of delivery of

[1] In case of direct contract between producers and consumers based on average prices, as are most contracts in the base metal sector, consumer may (and do) protest against having to pay prices that are artificially inflated by manipulation attempts. In order to maintain a good relations with their customers, producers may be forced to give price concessions. If they had hedged their sale, this implies that the loss they made on their hedge is no longer fully compensated by a higher sales price.

[2] Kenneth Gooding, "LME acts to set early warning of squeezes", *Financial Times*, 9 April, 1991.

Argentinean sugar (not very popular because of loading and transport problems) is sometimes used to force those who are long out of the market, thus depressing prices. Similarly , if it is known that a holder of a large short position is sitting on a stock of a highly-valued origin (e. g. Thai sugar), longs can keep their positions to force delivery.[1] In the metals market, in late 1990 a Swiss-based trade house forced a number of Japanese trade houses to deliver high-quality Aluminium (which normally commands a premium over the Aluminium which is the standard of the LME contract) to LME warehouses, and consequently took delivery of this metal.[2] Although , this type of action results in more volatile prices, it is not in general considered to be manipulation by regulatory authorities. Market participants are supposed to have access to the information they need to keep out of these situation, and if they want to play a game of arm-wrestling, they are entitled to do so, but it would be better for smaller market participants to keep out of such a situation.

Thus, an UNCTAD Report cautions : "At a certain moment, however, an invisible dividing line is passed, and activities start to fall into the category of concerted efforts to increase or decrease prices against which exchange officials and regulatory authorities act much more severely. The goals of the companies that try to manipulate prices may include taking cheap delivery of products or being able to sell at a high price; profiting through an increase or decrease in the prices to be paid in executable-order contracts; strengthening their own bargaining position in periodic price negotiations; or forcing the price of the commodity down in order to depress the share price of a company producing that commodity so that it can be taken over more cheaply."[3] The case of strengthening one's bargaining position through periodic price negotiation was reportedly attempted by Japanese zinc smelters early in 1992, when they pushed up prices to improve their bargaining position in ongoing price

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[1] *UNCTAD*, "Technical and Regulatory Conditions Influencing Participation in, and Usage of, Commodity Exchanges by Both Buyers and Sellers of Commodities", April, 1993.
Note that like all manipulation attempts, this carries risks. One such trade house trying to force another to deliver Thai sugar, failed in this attempt and was obliged to pay very high premiums in order to obtain Thai sugar in the spot market to fulfil it's physical delivery obligations.

[2] *World Commodity Report*, 8 November, 1990;
Financial Times, 23 November, 1990.

[3] *UNCTAD*, "Technical and Regulatory Conditions Influencing Participation in, and Usage of, Commodity Exchanges by Both Buyers and Sellers of Commodities", April, 1993.

negotiations with Australian mines. The smelters hoped that higher prices would make the producers feel better off and thus more willing to give way in these negotiations.[1]

The classic form of manipulation is the squeeze or corner which involves remaining long in futures while retaining a large part of the available stocks of the underlying commodity. Shorts are forced to deliver and thus have to buy the commodity from the longs for a high and presumably highly profitable price. Squeezes may start for technical reasons, such as a short-term shortage of the commodity deliverable to the exchange warehouses. However, trade houses generally anticipate this type of technical squeeze and profit from it. For instance, in a case of that kind on the aluminium market in June 1988, "major market-players (were) undoubtedly working the squeeze to their own advantage if not actually perpetuating it" (Metal Bulletin, 9 June, 1988). This kind of manipulation is very difficult to prove. Therefore the decision of regulatory authorities to intervene or not is necessarily a subjective one.

The 1993 UNCTAD Report cites a recent example of an alleged corner occurred on the CBOT soyabean market : "In mid-1989 the Italian food concern Ferruzzi had an open position in a nearby futures contract - which could be held for taking delivery - representing 23 million bushels of soyabeans, while only 12 millions bushels were stored in Chicago . Ferruzzi controlled three quarters of these stock. Those short in future contracts were thus threatened with a choice between paying high prices for soyabeans or paying the high fines that the exchange imposes when delivery obligations are not met. However, the CBOT board and the CFTC decided that Ferruzzi was trying to corner the market and forced the company to liquidate most of its contracts. Ferruzzi did so but accused the former CBOT chairman and other officials of "manipulating soyabeans prices downwards ... to avoid losses to their firms". The company of the CBOT chairman had a short position of 110,000 bushels for the relevant contract, and 2935 million bushels for customers' accounts;

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[1] Kenneth Gooding, "Fun and Games at the London Metal Exchange", *Financial Times*, 31 January, 1992;
Kenneth Gooding, "Rumour Race on Zinc Squeeze", *World Commodity Report*, 23 January, 1992.

another board member was president of a major grain company, with a short position of 910,000 bushels, and 2215 million bushels for customers' accounts. United States regulations do not clearly address the possibility of this kind of conflict of interest. Ferruzzi's charges were not found justified by American courts, but the case illustrates the potential difficulties with this type of intervention. Many farmers also felt that CBOT market intervention went against their interests and protested strongly. Legislators reacted by asking for a probe on "what safeguards exists to protect farmers' interests" when market regulators decide to intervene in price formation."[1]

This type of squeeze occurs quite often on the LME for all metals. For instance in 1987, "the markets are convinced that the LME copper backwardation is the result of manipulative action by one major trader - Phibro". (Metal Bulletin , 26 November 1987). In 1988, "the LME held an emergency meeting (...) over rising concerns that metal prices in several exchange markets were being manipulated higher by traders and speculators who were moving to corner supplies."[2] In 1992, "a small umber zinc producers and one trader reported to control between them about 1m tones of annual refined zinc output or about 15 to 20 percent of the western world total, have been using options to squeeze the market."[3] Cases where LME price developments have little to do with developments in the underlying physical market, or where LME stocks increase rapidly at the same time that prices are increasing, are quite common. This discourages potential users.

The most recent and shocking case of manipulation was demystified in July this year, when Japan's giant, Sumitomo Corporation reported that it had lost an estimated $1.8 billion as a result of unauthorised trading in copper futures by Yasuo Hamanka over a ten-year period. This translates into an average loss of $750,000 per

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[1] *UNCTAD*, "Technical and Regulatory Conditions Influencing Participation in, and Usage of, Commodity Exchanges by Both Buyers and Sellers of Commodities", April, 1993.
Indeed, an earlier *UNCTAD* report ("Commodity Exchanges and their Impact on the trade of developing countries", May, 1983) noted that while regulatory intervention measures of the type described above were taken when they concern non-United States companies, regulators were much more lenient when United States companies were involved.

[2] *World Commodity Report*, 15 June, 1988.

[3] Kenneth Gooding, "Nine-month Zinc Squeeze Fades in Heavy Trade", *Financial Times*, 24 September, 1992.

working day. Apparently the losses went undetected by the inspectors and backoffice people for ten years, and came to light only when Hamanka himself confessed to his unauthorised trades. Clearly there, the control system had failed.[1]

Meanwhile, as on June 20, copper prices have crashed 25 percent (i.e., by more than $800) in just six trading days to around $2,000 a tonne. This may well be the explanation of Sumitomo's staggering loss. It was running a huge long position in copper in both the cash and the futures markets. This is understandable as Sumitomo had a very large copper supply business for clients amounting to 7 percent of the world consumption. In fact Hamanka was known in the trade as "Mr. Five Percent", reputedly handling that proportion of the market as the most powerful trdaer in the gold copper business. While Sumitomo was long in copper futures, major short sellers (who must have profited hugely from the fall in copper prices) included George Soros' Quantum Fund and Jullian Robertson's Tiger Management, two of the biggest hedge funds.

David King, theLondon Metal Exchange's Chief Executive expressed concern and implied that the discovery that Hamanka had concealed losses of $1.8 billion over 10 years had resulted from action taken by the LME after the copper market had shown renewed volatility last November. He recalled that in November 1991, a London trader had sent the LME a hand-written letter from Hamanka asking for a backdated, fictitious trade worth $250 million. King said the LME again expressed concern to Sumitomo about its activities in the copper market in 1993. When the copper market became volatile again in last November, the LME Board authorised King to obtain from members details of their positions in futures and options, both on and off the exchange.[2]

Hamanka's arguement was that, far from squeezing the market to keep prices artificially high, he needed metal in hand to to cover deliveries if Sumitomo hit snags in its production of copper. But the worry for public watchdogs is that world prices of copper tend to be aligned on those that are set for futures contracts in the LME's

[1] A. V. Rajwade, *Business Standard*, 24 June, 1996.
[2] Kenneth Gooding, *Business Standard*, excerpted from Financial Times, 21 June, 1996.

open outcry daily "rings". And at values last year above $3,000 per tonne, the market seemed to be defying realities of supply and demand.[1]

To check such manipulations, the UNCTAD Report suggests : "Occasional discretionary regulatory interventions will remain necessary as long as some market players consider they are in a position to influence the market, even though such interventions necessarily disrupt the market. In order for buyers and sellers to have confidence in the market, it might be useful to reduce the number of discretionary regulatory interventions through the adoption of explicit measures such as a limit to the number of deliveries any one trader can make or take."[2]

However, measures like speculative position limits (which still exists on most of the commodity exchanges to prevent price manipulations as well as excess volatility) may tend to make the futures markets for agricultural commodities less liquid than other markets. Officials of commodity exchanges and managed funds argue that the resulting wider bid-ask spreads appear to allow for substantial returns.

Having completed a selective survey on price volatility in commodities in the last three decades, the risk reduction in futures markets; speculation, price stability and manipulation in the futures markets, we will now look at the Indian commodity futures markets in the next chapter.

[1] Nicholas Moore, *Economic Times*, excerpted from, Reuter, 17 June, 1996.
[2] *UNCTAD*, "Technical and Regulatory Conditions Influencing Participation in, and Usage of, Commodity Exchanges by Both Buyers and Sellers of Commodities", April, 1993

CHAPTER : 3

A SURVEY OF SPECULATION AND COMMODITY FUTURES TRADING IN INDIA

As noted earlier[1], futures trading is now permitted only in six commodities (castorseed, gur, turmeric, pepper, potatoes and hessian). The stringent regulatory measures imposed on such trading have seriously impaired the liquidity on such commodities. Accordingly, our survey in this chapter will essentially revolve around the major commodities like cotton and groundnut which have attracted substantial futures trading from 1953 to 1966, the period during which futures trading was permitted in such major commodities.

I) FUTURES TRADING AND PRICE EFFECTS :

In India, the futures market were under repeated attacks before the Second World War for various alleged malpractices in them, necessitating frequent reorganisations of some of the well-known exchanges in cotton, jute and oilseed. Although these malpractice virtually disappeared after the Forward Contracts (Regulation) Act entered the Statute Book in 1953, the days of appalling trial and turbulence for the organised commodity exchanges were still not over. Since the advent of planning, the prices of most agricultural commodities escalated to unprecedented high levels under the impact of inflationary pressures and supply shortage conditions, compounded by failing monsoon. Such a trend continued till the late sixties. And in the anxiety to curb the increasing price trend (which was supposed to be generated by 'speculative buying', the commodity futures markets became helpless victims of the uniformed criticism.

Such criticisms also arose from the argument that in a futures market, unlike the spot market, there were no effective limits to the buying in the commodity;

[1] Refer Introduction of this paper for the historical background of futures trading in India.

thereby aggravating the increasing trend in commodity prices. In fact, however, it is not correct to assert that there were no effective restrictions on the volume of purchases that could be made in a futures market. During the last few years in the life of futures trading in commodities like cotton, raw jute, groundnut and groundnut oil; the Forward Markets Commission levied in almost all the futures markets heavy special margins which were payable by 'long' operators on their outstanding business. During those years, the Commission also imposed direct limits on the quantum of open position which an operator could hold or control in a futures market. As a result of these measures, the total average open positions in many commodities remained very small as will be evident from Table 3.1. Since for different commodities , the average open positions in any year did not exceed 1 to 9 per cent of their total production (and were therefore even less than the monthly consumption of these commodities), futures markets could hardly have made any serious dent in the level of their prices during those four years.

TABLE No. 3.1

Total Average open positions in selected commodities in all future markets (Cotton: in '000 bales; other commodities in '000' tonnes)

Commodity	Average open position				Proportion of open position to total production (in per cent)
	1962	1963	1964	1965	
Cotton	108.0	224.0	302.0	61.9	5.4
Raw Jute	15.5	8.1	11.3		1.6
Groundnut(including Ground-nut shell)	127.7	145.0	86.4	0.2	4.5
Groundnut oil	62.7	66.4	52.1	9.4	6.0
Lineseed	16.4	16.9	25.1	25.3	6.5
Cottonseed	51.9	42.9	78.9	22.1	4.4
Rapeseed/Mustardseed	61.2	74.3	87.3		9.4
Cocunut oil	1.2	0.8	1.4	0.8	1.0

Source: Forward Market Commission

Besides, it is significant to note that in those years, the futures prices of most of the commodities facing conditions of acute shortages (like cotton, groundnut, rapeseed/mustardseed etc.) generally ruled below the corresponding ready prices.

This unusual phenomenon appears to have been caused by the high yield on stocks lying with the industry and trade, which reduces or inverses the cost of their storage. It is well recognised that in times of shortages, every industry prefers to hold large inventory raw materials in order to ensure uninterrupted supplies of such materials, lest it faces indefinite period of closure. Obviously, depending upon the degree of actual shortage in the economy, the stocks with any industry give rise to an unusually high yield when supplies are scarce; and if such yield tends to exceed the carrying costs, 'backwardation' emerges in the futures market. This backwardation, in turn, directly reduces the pressures on ready stocks and encourages the industry to make anticipatory purchases in the futures market. Thus, it is widely known that before futures trading in groundnut, groundnut oil, and rapeseed/ mustardseed was banned in May 1964, many reputed firms of crushers and vanaspati manufactures used to hold fairly heavy 'long' positions in futures markets in these commodities with a view to ensuring their requirements of raw materials at reasonable prices. A priori, therefore, one could unhesitatingly conclude that in so far as such purchases transfer the immediate effective demand of the industry from the ready market to the futures market, they have necessarily, albeit paradoxically, a moderate stabilising influence on the ready prices.

True, the speculative pressures are also encouraged in times of scarcity; but futures markets, in fact, act as safety valves for such pressures. This is because, in their absence, the prevailing speculative tendencies in the trading community assume a more serious and threatening form of hoarding which tends to dangerously escalate the inflationary trend in the economy. The sharp and sustained rise in the ready prices witnessed in gur and bullion during 1963 and in the groundnut, groundnut oil, rapeseed/mustardseed and groundnut oilcake immediately after the ban on futures trading in them vindicates the truth underlying this assertion.

It should be realised that when supply is inadequate and demand is strong, a rise in price is inevitable whether a futures market exists or not. After all, in the long run, futures market does not seek to influence either the trend of prices in any commodity or it's level. It rather seeks to reduce the amplitude of seasonal variations

in commodity prices by facilitating the smooth flow of goods from the producer to the consumer without causing the goods to become abnormally cheap during times of harvest or abnormally dear towards the end of the season. The Reserve Bank of India's study of seasonal variations in wholesale prices of certain commodities during 1951-52 to 1964-65 yields following results for certain major food and cash crops.

TABLE No. -3.2

Average of amplitudes (difference between maximum and minimum) of seasonal indices

Period	Rice	Wheat	Cotton Raw	Raw Jute	Groundnuts
1951-52 to 1955-56	11.4	9.5	4.5	14.8	14.6
1956-57 to 1960-61	13.0	10.4	4.3	8.0	13.8
1961-62 to 1964-65	12.0	10.3	3.7	5.7	13.4

Source: RBI Bulletin, June 1965 -Seasonal Variations and Secular trends in Wholesale prices 1951-52-1964-65.

The above table indicates that the seasonal amplitude of wholesale prices in commodities like cotton and raw jute which were served by well-knit futures markets was much smaller than in major food crops like rice and wheat which had no organised futures markets. It is especially significant that the amplitude of seasonal variations in raw jute declined sharply after the commencement of futures trading in it since 1958. Likewise, even in a commodity like groundnut in which the arrivals are generally concentrated and more uneven, the seasonal amplitude of prices showed a distinctly declining trend after the opening of futures markets in June 1956. On the other hand , no similar trend was discernible in two major food crops - rice and wheat. Although, it is arguable that many other factors besides futures trading might have contributed to the steady reduction in seasonal variations in price of commodities like raw cotton, raw jute and groundnuts, the evidence in the forgoing table makes it clear that the functioning of the futures markets caused no increase in the size of variations. Evidently, the conflicting suppositions that the commodity futures markets functions against the interests of either the growers or the consumers are scarcely well founded.

Commodity prices and price fluctuations are complex functions of many endogenous and exogenous variables. The quantitative measurement of the influence of any one of these variables is virtually an impossible task, since other price determinants operating simultaneously neither remain constant nor can always be

readily quantified. Nevertheless, a few attempts have presented evidence which, though quantitatively not conclusive, is qualitatively quite suggestive of the price-effects of futures trading.

In a comparative analysis of intra-month and intra-fortnight price fluctuations in groundnut for periods with and without futures trading extending from November 1951 to October 1966, Pavaskar[1] discovered that the average intra-month price fluctuations (expressed as percentages of the respective months' average prices) ranged between 4.65 and 8.48 for the period with futures trading, whereas in the period without futures trading they ranged between 7.56 and 16.36 percent. Likewise, the intra-fortnight price fluctuations ranged between 2.14 and 5.88 percent in the presence of futures trading, but ranged much higher between 4.72 and 12.33 in the absence of futures trading.

A. S. Naik[2], also found that monthly and weekly average price of groundnut, linseed and hessian were relatively more stable around their respective seasons' mean prices during years with futures trading than during years with little or no futures trading. He had covered the years between 1951-52 to 1965-66 for groundnut and from 1952-53 to 1965-66 for linseed and hessian. Table 3.3, borrowed from his study reveals that the variability in commodity prices was visibly lower in the years with futures trading than without it.

TABLE No. -3.3

Pooled (average) co-efficients of variation for monthly and weekly average prices in Groundnut, Lineseed and Hessian for period with Future trading and period with little or no Futures trading.

Commodity	Coefficient of variation			
	For monthly average prices		For weekly average prices	
	Years with Futures Trading	Years with little or no Futures Trading	Years with Futures Trading	Years with little or no Futures Trading
Groundnut	5.77	9.45	5.15	9.57
Lineseed	6.71	7.31	7.11	7.53
Hessian	5.86	7.24	6.08	7.17

Source: A.S. Naik, "Effects of future trading on prices", Bombay 1970.

[1] M. Pavaskar, "Futures Trading and Price Variations", *Economic and Political Weekly*, Vol. 5, 1970.

[2] A. S. Naik, "*Effects of Futures Trading on Prices*", Somaiya Publications, Bombay, 1970.

True, the evidence of beneficial price effects of futures trading in some commodities does not *ipsi facto* prove that similar effects would follow for other commodities. One may also argue that other influences besides futures trading might have reduced price variations in the aforesaid commodities during years with futures trading . Nevertheless, the evidence clearly does not support the common held belief that futures trading accentuates the amplitude of price fluctuations.

Futures markets are at times blamed for aggravating upward or downward price trends resulting from shortages or surpluses respectively. But the available evidence from Naik's work is just the opposite . An analysis of futures market price forecast in cotton, groundnut and castorseed through statistical comparison of futures prices prior to the delivery month with those during the delivery month has revealed that a downward bias in such forecast is closely associated with an upward trend of prices as vice versa. In other words, contrary to the popular belief, futures market operators do not throw caution to the winds while trading. In an analysis of the long term price trends in groundnut, linseed and hessian by the least-square regression method with dummy values assigned to years with and without futures trading, Naik[1] also observed that futures trading generally reduced the rates at which the trends were rising in all the commodities.

II) SPECULATION AND PRICE STABILITY

In order to ascertain the price stabilising influence exercised by a few major selected futures markets , Pavaskar based on Kaldor's concept of elasticity , speculation and price stability[2]; worked out 'elasticities of futures price' for the consecutive four week period for the six crop years (1957-58 to 1962-63) in groundnut and castorseed; and rapeseed/mustardseed (1958-59 to 1963-64) and for the five crop years (1958-59 to 62-63) in raw jute and jute goods.

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[1] A. S. Naik, "*Effects of Futures Trading on Prices*", Somaiya Publications, Bombay, 1970.

[2] A detailed discussion of Kaldor's concept of elasticity, speculation and price stability has been done on Chapter I.

Pavaskar suggested a minor modification before one can adopt Kaldor's concept to assess the stabilising influence of the forward markets : "Kaldor's elasticity concept seeks to measure a change in the expected price as a proportion of a given change in the ready price. But a change in the ready price for any period of time, includes a small but determinable change due to carrying costs which a forward market cannot and does not seek to eliminate. Carrying costs are included *ab initio* in every futures price; ready price, during a given period, therefore, must rise more (or fall less) by an amount equal to the actual costs of carrying stocks during that period than the rise (or fall) in the futures price. A variation caused in the ready price on account of carrying costs, however, cannot be in the ready price for the same period after excluding from the latter the percentage change that may be attributed to normal carrying costs. Interpreted as a destabilising influence of the futures market and, therefore, for the purpose of measuring the elasticity of futures price in any commodity, such variation should be excluded from the actual gross change in the ready price. The elasticity of futures price for any period of time, therefore, should be expressed as a percentage change in the futures price during that period measured as a proportion to a like percentage change in the ready price for the same period after excluding from the latter the percentage change that may be attributed to normal carrying costs."[1] His results are summarised in Table 3.4 given below in the next page.

It is evident from the Table 3.4 that in groundnut, out of 60 four-week periods from November 1957 to October 1963, the elasticity of futures price was positive and more than unity during only seventeen occasions, while during the remaining 43 four-week periods the elasticity of futures price was less than unity. In other words, in almost three out of four occasions, the forward market in groundnut at Bombay imparted a stabilising influence on the ready prices during the six seasons from 1957-58 to 1962-63. The stabilising influence was rather sharply in evidence when the ready prices were falling than when they were rising. But although the

[1] M. Pavaskar, "Futures Markets Stabilise Prices", *Economic Weekly*, June 27, 1964.

Table No. 3.4

Elasticity of Futures Prices for Commodities

Commodity	Year	No. of 4 week periods when elasticity of future price was less than unity (+1)		No. of 4 week periods when elasticity of future price was more than unity	
		In rising ready market	In falling ready market	In rising ready market	In falling ready market
1. Groundnut (Bombay)	1957-58	4	4	1	2
	1958-59	4	3	3	-
	1959-60	4	3	3	-
	1960-61	2	4		-
	1961-62	3	2	3	2
	1962-63	4	6	2	1
2. Castorseed (Bombay)	1957-58	2	7	3	-
	1958-59	2	5	3	3
	1959-60	5	4	2	2
	1960-61	1	6	4	2
	1961-62	1	6	5	1
	1962-63	1	7	2	3
3. Rape-seed-Mustard (Agro)	1958-59	4	3	3	2
	1959-60	2	5	2	4
	1960-61	5	2	2	4
	1961-62	6	5	2	-
	1962-63	2	5	3	1
	1963-64	3	3	6	1
4. Raw Jute (Calcutta)	1958-59	2	8	1	2
	1959-60	4	5	4	-
	1960-61	3	1	1	-
	1961-62	4	6	1	2
	1962-63	6	6		-
5. Hessian (Calcutta)	1958-59	4	5	1	1
	1959-60	3	2	5	3
	1960-61	2	1	1	-
	1961-62	6	5	2	-
	1962-63	2	7	4	-
6. B. Twills (Calcutta)	1958-59	2	2	1	6
	1959-60	4	5	3	-
	1960-61	2	1	1	-
	1961-62	3	7	3	-
	1962-63	2	8	1	2

Source : M.G. Pavaskar, Futures Markets Stabilise Prices, *Economic Weekly,* June 27, 1964

forward market tended to accelerate during 12 occasions the rising trend in the spot prices of groundnut, during 21 other occasions it tended to arrest such trend.

In castorseed, the elasticity of futures price was less than unity during as many as 47 of the 77 selected four-week periods for the six years from November 1957 to October 1963. While the stabilising influence of the forward market was more effective whenever the trend of spot prices was a falling one, its efficacy in the rising ready market was evident during 12 of the 31 four-week periods.

In the rapeseed/mustardseed market of Agra, the elasticity of futures price was less than unity during 45 of the 75 four-week periods from April 1958 to March 1964. In the rising spot market, the elasticity of futures price was less than unity during 22 of the total of 40 four-week periods.

In the raw jute market of Calcutta, the elasticity of futures price was less than unity (and the futures market in it could therefore be said to have imparted a stabilising influence on the ready prices) during 45 of the 56 four-week periods from July 1958 to June 1963. In Hessian and B Twills, the elasticity of futures price was less than unity during 47 and 36 four-week periods out of the total of 54 and 53 such periods, respectively. In both raw jute and jute goods, the stabilising influence of the forward markets was in evidence during periods of falling as well as rising ready prices.

From his analysis of elasticities of futures prices in selected commodities, Pavaskar thus concludes : "there is strong reason to believe that commodity futures markets, more often than not, exert considerable steadying influence on the prices of ready goods. Despite the inflationary forces prevalent in the economy during that period, and the acute shortages that were felt for the last six seasons in edible oilseeds and during the three seasons from 1958-59 to 1960-61 in raw jute, forward markets had by and large assisted in arresting the rising price trend in these commodities. Similarly, during the last two seasons, viz.; 1961-62 and 1962-63, the futures markets in raw jute and jute goods helped considerably in supporting the spot

prices of these commodities at lower levels and acted as a bridle in checking the rapidly falling trends caused by the successive bumper raw jute crops."[1]

The success of forward markets in stabilising prices of commodities subjected to futures trading may also be attributed to two other reasons. Firstly, the various regulatory measures adopted by the Forward Markets Commission, from time to time, to prevent speculative excesses in the forward markets have generally tended to reduce the elasticity of expectations of the trade, and the elasticity of futures price has therefore often remained either less than unity or even negative. Secondly, the forward markets in most of the commodities facing shortages have acted as safety valves for the prevailing speculative tendencies in the trading community, which would have otherwise assumed a more serious and threatening form of hoarding of actual stocks and aggravated the inflationary pressure in the economy. Evidently, the popular belief that forward markets accentuated the price movements in the spot markets seems to be misconceived.

Given such general findings about the Indian Futures Markets, in the final two sections we will make a brief survey of the commodity specific analysis of futures trading in cotton and groundnut during the relevant period.

III) COTTON FUTURES MARKET :

READY FUTURES PRICE RELATIONSHIP :

Pavaskar's extensive empirical work on the cotton futures market[2] in India gives a clear picture of the economic forces operating in the futures market during that period and its effect on the ready market. Pavaskar's analysis of the weekly average ready and futures prices data of cotton at Bombay for the period from 1953-54 to 1963-64 reveal that except during the periods when the ready prices consistently ruled unchanged, being at the statutory ceiling levels, large swings in the futures prices were usually accompanied by similar swings in the ready prices. In fact, the association between the day-to-day changes in the ready prices and the 'opening'

[1] M. Pavaskar, "Futures Markets Stabilise Prices", *Economic Weekly*, June 27, 1964.
[2] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.

prices of futures contracts of cotton was also close enough not to be a mere chance of association. Out of 1797 instances in a period of six years from 1953-54 to 1958-59, in as many as 971 instances or 54.1 per cent of the total, there were similar (i.e., in the same direction) movements in the ready and futures prices (as shown in Table 3.5).

The reverse movements were observed in only 104 instances or 11.3 per cent of the total. The remaining instances were of irregular character in the sense that in each of such instances only one price recorded change while the other remained unchanged. But in fact, in over 93 percent of these instances, the change was registered in the futures price while the ready price had remained unchanged. The instances with 'change in ready price and no change in futures' were barely 41. According to Pavaskar, a high proportion of instances of unchanged ready price arose for two reasons. First, the prices of ready prices in the ready market are usually less susceptible to quick day-to-day fluctuations than the prices in the futures market which is necessarily more volatile because of its rapid and large turnover. The leadership of the futures price may therefore sometimes take more than a day to assert itself on the ready price. Meanwhile, the ready price remains unchanged.

But hedging effectiveness presupposes that ready and futures prices move not merely in the same direction but also by the same or almost similar amount. Of course, partly as a result of the varying influence of the carrying costs on the two markets and partly since the proximate causes that determine ready and futures prices at any time are necessarily different, a perfect collinearity in the magnitude of the day-to-day changes in the ready and futures prices is generally not expected. Nevertheless, it was observed that out of 971 instances of like movements, in as many as 640 instances, the day-to-day changes in ready price varied between 50 and 150 % of the corresponding change in futures price. In other words, in almost two-third of the instances of similar movements, there was a fairly close association between the ready and futures prices in terms of magnitude. These 640 instances, however, constituted barely a third of all instances, and even if instances of irregular price movements were to be excluded, their proportion just exceeds 50 % of the remaining instances of like

Table No. 3.5

Association of Changes in Day to Day Opening Futures Prices of Cotton with Similar Changes in its Ready Prices for all years from 1953-54 to 1958-59

Class of association	No. of Instances	Percent Distribution
I. Similar Movements	971	54.1
(a) Both Increasing	491	27.3
(b) Both Decreasing	442	24.6
(c) Both Unchanged	38	2.2
II. Reverse Movements	204	11.3
(a) Futures Increasing - ready decreasing	121	6.7
(b) Ready Increasing - Futures Decreasing	83	4.6
III. Other Movements	622	34.6
(a) Futures Unchanged - Ready Increasing	19	1.1
(a) Futures Unchanged - Ready Decreasing	22	1.2
(a) Ready Unchanged - Futures Increasing	299	16.6
(a) Ready Unchanged - Futures Decreasing	282	15.7
Total Instances	1797	100

Source : M.G.Pavaskar, '*Economics of Hedging*', 1976

and reverse movements. At the first view, therefore, the ready-futures price relationship in cotton does not appear to be invariably conducive to effective hedging.

The bias of the cotton futures market in favour of buying hedgers is evident from the data in Table 3.6, again excerpted from Pavaskar's study. The price data relied upon cover the period from November to August for every season, August being the last delivery month of each season's futures contract. It may be seen from Table 3.6 that during the years under study by Pavaskar[1], the average monthly ready-futures price spreads in cotton were consistently negative i.e., the cotton futures contract at Bombay ruled always at a discount below the corresponding ready price of its 'basis' variety. The average discount for all years from 1953-54 to 1963-64 was Rs. 47.34 per 3 quintals. But the actual average monthly discounts varied between 8 paise in March 1962 for March 1962 delivery and Rs. 108.54 in May 1957 for May 1957 delivery. The discounts were small at times as in the case of March 1960 and March 1962 deliveries only because the ready prices were nominally quoted at the statutory ceilings though cotton was unofficially traded in the market at substantial premiums above such prescribed ceilings.

More important than the negative spreads are the changes in such spreads over the expectation period (duration) of each futures contract delivery. Out of 26 deliveries traded in during the 11 seasons, the monthly average negative spread showed a 'net' reduction from the month of commencement of trading (or November, whichever was the subsequent month) till the month of maturity in as many as 18 deliveries. Only in 8 deliveries, such spread registered a 'net' rise. Similarly, the variations in the average monthly spreads from the preceding month to the immediately succeeding month of the same delivery showed that during the 11 seasons, the negative spread lessened in 64 months but increased in only 32 months. And even among these 32 months, the negative spread increased by less than the amount of carrying costs in as many as 14 months, while it increased by more than the carrying costs in only 18 months.

[1] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.

Table No. 3.6

Average Monthly Spreads between Ready and Futures Prices of Cotton at Bombay
Futures Over Ready

(i) February and March deliveries (In Rs. per 300 kgs)

	Month				
	November	December	January	February	March
February	Deliveries				
1954	-41.5	-58.93	-55.71	-60.76	-
1955	-	-67.61	-52.35	-28.31	-
1956	-	-53.46	-58.07	-	-
Average	-41.5	-60	-55.38	-44.54	-
March	Deliveries				
1957	-	-63.82	-69.01	-65.64	-26.45
1958	-39.31	-48.67	-41.67	-37.26	-16.95
1959	-	-31.09	-32.32	-32.72	-25.98
1960	-	-49.84	-48.4	-32.34	-1.28
1962	-53.66	-22.5	-8.78	-1.71	-0.08
1963	-89.25	-89.08	-77.34	-64.97	-59.17
1964	-86.52	-75.79	-53.62	-42.47	-19.86
Average	-67.19	-54.4	-47.31	-39.59	-21.4

(ii) April and May deliveries (In Rs. per 300 kgs)

	Month						
	November	December	January	February	March	April	May
April	Deliveries						
1961	-95	-92	-102	-107.75	-97.25	-104.5	-
May	Deliveries						
1954	-37.23	-59.25	-60.61	-79.92	-68.45	-67.35	-63.51
1955	-	-74.67	-58.31	-41.76	-40.49	-22.47	-17.46
1957	-	-	-	-	-93.07	-78.48	-91.56
1958	-	-	-42.85	-40.91	-30.7	-32.12	-23.46
1959	-	-	-	-34.37	-11.59	-26.33	-31.97
1963	-	-	-	-57.21	-70.08	-66.74	-63.88
1964	-	-	-66.42	-39.83	-55.79	-47.26	-78.33
Average	-37.23	-66.96	-57.06	-47.83	-52.88	-48.68	-52.02

III. August Deliveries (Rs. per 300 Kg)

	Month					
	March	April	May	June	July	August
1954	-58.95	-53.27	-44.99	-44.04	-45.26	-23.38
1955	-	-10.6	-20.09	-10.82	-17.93	-4.74
1958	-	-22.86	-10.17	-12.83	-21.05	-20.23
1959	-	-24.25	-24.09	-33.26	-35.57	-30.22
1960	-45.68	-38.44	-36.38	-25.31	-25.31	-
1961	-86.74	-102.95	-107.59	-77.71	-76.96	-64.59
1963	-	-62.15	-68.17	-67.48	-65.82	-68.04
1964	-	-66.93	-75.65	-66.37	-57.15	-38.67
Average	-63.79	-47.68	-48.39	-42.23	-43.13	-35.71

Source : M.G.Pavaskar, '*Economics of Hedging*', 1976

When one compares the above analysis of variations in the ready-futures price spreads in cotton with our earlier discussion on changes in price spreads and hedging effectiveness, it at once becomes clear that the Indian Cotton Contract was heavily lopsided in favour of the buying hedgers , for, on an average in 5 out of 6 months , changes in price spreads favoured such hedgers . On the other hand, the selling hedgers seem to have benefited from changes in the ready-futures price relationship in only one month out of six.

Moreover, Pavaskar observes that : "It is matter of common knowledge that the exporters of cotton could not avail of the hedging facility provided by the cotton futures market as their exports were mainly confined to Bengal Deshi cotton which was not tenderable against the Indian Cotton Contract. Moreover, the East India Cotton Association provided facility for trading in transferable specific delivery contracts in Bengal Deshi cotton, which were manifestly more useful to exporters than future contracts for hedging their export commitments. Similarly, as the cotton textile mills were interested in cotton of only specific varieties and grades suitable for their individual requirements, they preferred purchases of non -transferable specific delivery contracts to those of future contracts. Hence, though the cotton futures market offered the mills adequate cover against the risk of price rise, it was virtually neglected by the mill."[1]

The cotton merchants and stockists, on the other hand, usually needed the hedging facility offered by the futures market. They required protection against the risk of price fall of involved in their forward (non-transferable specific delivery) purchases and stocks of cotton insofar as such purchases and stocks were not covered by their (n. t. s. d) sales to mills. But unfortunately, as revealed by the Pavaskar's analysis of the ready-futures price spread, the Indian Cotton Contract was largely biased during the period under study against this important class of traders which operated in the futures market as selling hedgers . And it is because of this untoward bias that the utility of the cotton futures market seems to have been considerably impaired for the purpose of hedging . True, merchants also sometimes

[1] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.

enter the futures market as buying hedgers , as , for example, when their forward sales to mills exceeds their forward purchases and current stocks; but such occasions are rare and usually never extend beyond the early marketing months.

BIAS :

Pavaskar's work[1] on the results of the average profits and losses in the ready markets in cotton for hedges of one and two months duration respectively for a six year period concluded that there has been a bias against the short hedgers. During the years under study (1953-54 to 1954-55, 1956-57 to 1958-59, and 1962-63) it was revealed that , by and large, the ***long-basis interests*** suffered losses in the ***ready*** market, whereas the ***short-basis interests*** made profits. The 'long-basis' interest involved holding of commodity stocks or acquisition of forward purchases. The 'short-basis' interest involved accumulation of forward sales. The 'long-basis' interests in the ready market have necessarily 'short-hedge' interests in the futures market, while the 'short-basis' interests have likewise 'long-hedge' interests in the futures market. The need for hedging, therefore, must have been felt more acutely by the long-basis interests (stockists) rather than the short-basis interests; the latter must have generally offset their losses in the ready market on a relatively few transactions by large profits made in many others. The long-basis interests, on the other hand, incurred heavy losses in the ready market on most of their transactions but had less opportunities to offset them by gains in other transactions. The 'net' losses in the ready market for the long-basis interests were not wholly unexpected, since the years selected for the study by Pavaskar, generally experienced comfortable supply situation in cotton with its prices (both ready and futures) ruling for the most part of the period below the prescribed statutory ceilings. Nevertheless, the nature and the amount of inequality between price declines and advances in the ready market --- in both the number and magnitude --- suggested the need for futures market for hedging was greater for the long-basis interests (buyers and stockists) in the ready market than for the short-basis interests (forward sellers).

[1] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.

The study further revealed that the profits and losses in the ready market varied directly with the length of the period. The profits and losses in the ready market in cotton averaged almost one and a half times as large for the two-month periods as for the one-month periods. Clearly, the need for hedging was greater when either the stocks were held for long periods by the long basis interests or more distant maturity forward sales were entered into by the short basis interests. But, with the total instances of losses in the ready market for two-month periods almost twice as many as the instances of profits, and the average profits therein only about three-fourths as large as the average loss, the need for futures market was manifestly greater for the long-basis interests in the ready market than for the short basis interests.

The similarity of profits and losses in the ready and futures markets evidently discloses that the ready and futures prices of cotton were more in discord than in concord during the relevant period. This contrary pattern in ready and futures prices manifested itself both in the number of price changes in the ready and futures market as well as their magnitude.

The above analysis by Pavaskar[1] led to two major implications which broadly explains the behaviour of the ready and futures prices in cotton. First, since the number of effective hedges were more and their degree of hedging efficiency was large when profits or losses in the ready market were high, it follows that a large change in the level of price in the ready market was generally associated with a change in the similar direction in the level of the futures price. Nevertheless, though the two price changes were similar in direction, their magnitude was rarely the same. When the ready price fell, the futures price declined less rapidly and hence effective hedges only partially reduced the hedgers' losses in the ready market. On the other hand, when the ready price rose, the futures price advanced by a greater amount than the ready price and, therefore, the profits of the short hedgers often turned into net losses. This diametrically conflicting behaviour of the cotton futures market in the phases of rising and falling prices, emerged because the cotton futures prices was

[1] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.

exceedingly depressed when trading commenced in the futures contract for any delivery. Therefore, when the ready price declined, the futures price which was already over-depressed, did not decline by the same amount as the ready. But if during the intervening period, the ready price advanced, the futures price rose by a relatively larger amount to reach as close to the ready price level during the maturity month as it is theoretically and practically necessary.

Secondly, it was quite evident that when the ready price of cotton was relatively stable, i.e., when the losses and profits in the ready markets were small, the futures price recorded wider variations which gave rise to a large number of ineffective hedges with a high degree of negative hedging inefficiency. A *priori*, one might be tempted to attribute these wide variations in futures price in the backdrop of a relatively stable ready price to the speculative pressures that were at work in the futures market. But, Pavaskar argues, "since the negative hedging efficiency mainly arose due to either increase of losses in the ready market or change of profits therein into net losses, it necessarily followed that the cotton futures price usually rose even when the ready price was stable. Short-term speculative pressures which operated to accelerate both the rising as well as the falling trends in prices could therefore scarcely explain such a consistent upward movement in the futures price when the ready price was relatively stable."[1] A logical explanation lies in the fact that the futures price was at a heavy discount below the prevailing ready price when trading in the futures contract for any delivery month commenced. The futures price, therefore, was expected to rise relative to the ready price throughout the expectation period (length) of the futures contract.

The fact that the long hedgers could generally benefit from hedging whereas the short hedgers could operate only with considerable risk, suggests that the use of the cotton futures market for hedging must have been very restricted during the period under study. This would be evidently so because the need for hedging in any commodity is acutely felt by the dealers and the stockists more than any other class of market functionaries. In the cotton trade, this is specially so because the conventional

[1] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.

long hedgers like the mills and the exporters, preferred to hedge their forward sales through either acquisition of stocks or purchase of n.t.s.d. contracts which ensures them the delivery of the specific variety of goods needed for manufacture or export. True, the cotton merchants and stockists had some selective use of the futures market for both long and short hedging. But the long hedge transactions of merchants were necessarily small, since, except during the few pre-marketing months, their unsold stocks normally exceeded their forward sales to mills. Hence, merchants had mostly 'net' stocks, rather than forward sales, to hedge. However, insofar as the cotton futures contract discouraged regular short hedging, it not only did not offer adequate hedge protection against price risks on stocks, but also failed to perform its legitimate economic role in the marketing of cotton, since such discouragement generally dissuaded the trade from accumulating and carrying cotton stocks for storage.

BACKWARDATION :

The causes of the general hedging inefficiency of the cotton futures market during the period under study and the bias in it against the short hedgers may be found in the behaviour of the relationship between the ready and the futures prices of cotton, studied in great details by Pavaskar. In the cotton market, contrary to normal expectations about the futures price to be higher than the ready price by an amount approximating to the actual cost of carrying stocks, it was observed by Pavaskar[1] that the futures price invariably showed a backwardation which usually varied around Rs. 40 per 300 kg, but, at times, was even as high as Rs. 100. It may be admitted that backwardation *per se* need not impair the hedging efficiency of any futures contract, provided such backwardation increases by the amount of carrying cost as the contract approaches its maturity. But the chance of any such increase in backwardation are necessarily small in any commodity futures market. This is because subject to qualitative price differentials and the tenderable allowances prescribed, the ready and futures price of any commodity cannot significantly differ from each other during the delivery period of a futures contract. Normally, therefore, the premium or the

[1] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.

discount commanded by the futures price over the ready price, tends to be reduced as the futures contract advance towards its delivery period. As was evident earlier, the amount of backwardation in the cotton futures market also steadily shrinked as the futures contract approached the due date. As a result, over the length of any futures contract delivery in cotton, the futures price generally rose relative to the ready price. It was this typical behaviour of the futures price in relation to the ready price of the basis variety that mainly explained the average inefficiency of the Indian Cotton Contract for the purpose of hedging and the bias in it against the 'short' hedgers who were sellers in the futures market and who, therefore could not benefit from the contract which advanced in price relative to the price of the ready commodity.

Since the large and persistence backwardation was the source of hedging inefficiency of the cotton futures market, it was imperative to examine the underlying causes of both the abnormal backwardation in the market and its movement during the expectation period of the futures contract. The principal reasons normally adduced to explain the backwardation in the cotton futures price were three. They are (i) broad futures contract, (ii) expenses for surveys and appeals, and (iii) system for fixing tendering differences.

(i) Broad futures contract : The Indian Cotton Contract was a broad based contract, most of the varieties of cotton grown in the country being tenderable against it. According to the Forward Market Bulletin, March 1960, the total types of cotton which could be tendered against the Indian Cotton Contract would be 660 (22 varieties × 5 staple lengths × 6 grades). Evidently, the buyer of the cotton futures contract faced an uncertainty regarding the type of cotton that he might have received in tender. More often than not, he might have received a tender in variety other than the one which he really needed. It is stated that this fact tended to depress the cotton futures contract below the ready price of the 'basis' variety so as to attract the buyers. Although this reason might explain the abnormal relationship between the ready and futures prices, it appeared hardly adequate to account for the unusual discount at which the Indian Cotton Contract was generally quoted long before the delivery period, when the carrying charges the seller had to bear on its stocks should

have been reflected in the prices of the futures contract. The broad based nature of the futures contract could therefore explain but a fraction of the total backwardness in the cotton futures price.

(ii) Expenses for surveys and appeals : The cotton tendered against the futures contract was frequently of inferior quality, and as such the buyers were usually compelled to demand surveys, and go in for appeals and even super-appeals before they could accept the goods and pay the quality premiums thereof. Thus, during the 1963-64 season, out of the total tenders of 45,050 bales issued against the Indian Cotton Contract, 80.8 % of the total were surveyed. Appeals were preferred against the survey results in respect of 66 % of the total tenders, while super-appeals were lodged for 43 %. As the survey fees were payable by the buyer and the seller equally, while the appeals and super-appeal fees were payable by the appellants, a buyer in the cotton futures market incurred more for receiving deliveries against the futures contract, specially if he was to go in for appeals and super-appeals, than if he had bought cotton directly from the ready market. Allowing for the survey fees, the trouble and other expenses incurred in attending survey and subsequent proceedings, Pavaskar estimated the total additional expenses to a buyer on this account were not likely to exceed Rs. 5 per 300 kg. These expenses, therefore, also explained only a small part of the total negative spread that was witnessed in the cotton futures market.

(iii) Manner of fixing tendering differences : It was widely believed that the third and perhaps the most important reason for the presence of large negative spread in the cotton futures market at Bombay was the system of fixing 'tendering differences' at the East India Cotton Association. It was this practice of fixing tendering differences on the basis of difference between the future contract rate and the ready rate of the tenderable variety rather than on the basis of actual difference between the ready rate of the basis variety and the ready rate of the tenderable variety that seemed to explain the unusual discount at which the cotton futures contract was quoted at Bombay. The practice, it was alleged, gave rise to a fear in the minds of the buyers of the futures contract that unduly large premia might be fixed by the

association for tender of superior varieties, if, during the delivery period, the futures contract were to be at a discount below the ready price of the basis variety. The fear discouraged buying, aggravated the bearishness of the futures contract and thereby increased the actual discount for it. It was for this fear perhaps, that the negative spread between the ready and the futures price of cotton was generally large after the commencement of trading in any delivery. In fact as the tendering differences were usually fixed only a few days before the month of delivery, there was probably no maximum limit on the amount by which a cotton futures contract could rule at a discount below the ready price during the pre-delivery.

Pavaskar argues that : "though it may be conceded that the system of fixing tendering differences at the EICA did explain the size of the backwardation in the cotton futures price during the delivery period, it did not explain the movement of such backwardation in the pre-delivery period of the futures contract. The backwardation was very large at the commencement of trading in any delivery, but was reduced gradually as the contract approached its maturity. If heavy backwardation in the cotton futures price immediately after the commencement of trading in it was the outcome of uncertainty arising out of the system of fixing tendering differences at the EICA, then there was no reason why such backwardation should have steadily shrinked during the currency of the futures contract, for the uncertainty about the tendering differences did not just vanish or even reduced till tendering differences were actually fixed in the month preceding the delivery month."[1]

(iv) Risk premium : Venkataramanan[2] attributed the backwardation in cotton futures price to the hedger's risk premium. But, Pavaskar's study concluded that the risk premium, if any, was payable by the long hedgers rather than the short hedgers. Besides, in markets where speculative activity (both on the long and short sides) exceeded by many times the hedge activity (Pavaskar puts the speculative activity during the aforesaid period as 90 % of the activity in the cotton futures market), it was absurd to expect that that the speculators could receive any such service fee as

[1] M. Pavaskar, "*Economics of Hedging*", Popular Prakashan, Bombay, 1970.
[2] L. S. Venkitaramanan, "The Theory of Futures Trading", Asia Pubishing House, Bombay, 1965.

risk premium from the hedgers. A priori, therefore, it appears that backwardation in the cotton futures market was not the result of the hedgers' risk premium. Pavaskar made a linear multiple regression test of the following type :

$$X_1 = a + b_2 X_2 + b_3 X_3$$

where X_1 = expected average returns to speculator buyers,

X_2 = average cotton stocks at Bombay,

X_3 = expectation period.

This equation was used to examine the relationship between the volume of stocks and the expected returns to speculator-buyers of futures contract for deliveries traded during 1953-54 to 1962-63. The regression coefficient for X_2 was, in fact, found to be statistically significant not only for all observations together, but also for different delivery months separately. Further, the consistent negative regression coefficient for volume of stocks (X_2), showed that the returns to speculator-buyers and hence also the backwardation were partly, if not mainly, the result of the yield on cotton stocks held by the trade and the industry from time to time. At the same time, it was not so much the result of the hedgers' risk premium as was believed by Venkataramanan. Had it been so, the returns to speculator-buyers would have shown a definite positive correlation with the volume of cotton stocks.

(v) Yield on stocks : After the partition of the country in 1947, India was facing acute shortage of cotton. Year after year since then, the indigenous cotton production had failed to match the growing demand from the industry. While the total investment in the industry which was already large before Independence had steadily swelled thereafter owing to the increase in the spindlage and the modernisation of plant and machinery, the industry became more and more dependent on imports. Since, however, imports were restricted in view of the foreign exchange control, the cotton textile industry had all along found it difficult to get its requirements of raw cotton. Many financially stronger units often held cotton stocks equivalent to their 4 to 6 months' consumption requirements, while the weaker units functioned far below their capacity. Thus, during the period when futures trading in

cotton took place, the cotton stocks had a very high yield. Pavaskar attributed this high yield to the backwardation in cotton prices.

IV) FUTURES TRADING IN GROUNDNUT :

Naik's study[1] on futures trading in groundnut gives a clear picture of the effect of futures trading on ready prices in that commodity. The basic data amassed for the study comprised ready prices for Karad Bold Variety 'basis' for groundnut. Groundnut is sown during the monsoon and harvested after October. Naik selected a 15-year period from 1951-52 to 1965-66 for testing the influence of futures trading on seasonal price variations.[2] As marketing of new crop groundnut begins in November each year, the period November to October was adopted as the groundnut season or year. Out of the 15 selected seasons, there was substantial futures trading during as many as six seasons, 1956-57 to 1959-60, 1961-62 and 1962-63. Of the remaining nine seasons, there was absolutely no futures trading during six seasons from 1951-52 to 1955-56. The other three years, namely, 1960-61, 1963-64 and 1964-65, was also grouped in the same time period with little or no futures trading, since there was very little or no futures trading for almost half the time in each of those three years. Table 3.7 and Graph 3.1 discloses the pattern of the pattern of seasonal variations in groundnut prices for the years with futures trading and also for those with little or no futures trading.

In both the periods, Naik found that the groundnut prices ruled low during the immediate post-harvest months of November and December, and advanced steadily till the onset of the monsoon in June/July. With lean arrivals, and reduced stocks, the seasonal index ruled around its peak during the early monsoon months. After August/September, however, in the wake of the reports of the progress of the new crop and the approach of the marketing season, prices rapidly declined to meet the anticipated post-harvest depression.

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[1] A. S. Naik, "Effects of Futures Trading on Prices", Somaiya Publications, Bombay, 1970.

[2] . The price used was monthly index number of seasonal prices which was constructed by expressing each deflated average monthly ready price as a percentage of the simple average of the corresponding year's twelve months' deflated prices.

Table No. 3.7

Mothly Index Numbers of Seasonal Prices of Groundnut

Month	Years With Futures Trading	Years With Little or no Futures Trading
November	94.45	91.79
December	94.24	93.26
January	96.87	95.34
February	98.42	96.58
March	99.25	98.84
April	102.02	102.09
May	101.93	105.03
June	104.03	103.27
July	103.78	106.73
August	102.81	105.96
September	103.43	103.47
October	98.77	97.65
Range between Highest and Lowest Seasonal index Number	9.79	14.94

Source: A.S.Naik, *Effect of Futures Trading and price,* 1970

Although for both the periods the actual seasonal trend represented the expected trend, the graph strikingly revealed that the curve of the seasonal price indices for years with futures trading was less sloping than both in its upward movement from November to the early monsoon months and the downward movement thereafter till October than for the years with little or no futures trading. The conclusion is obvious that the seasonal variations in groundnut prices were smaller in the years with futures trading than in the years without such trading. The seasonal prices of groundnut remained lower after the harvest and higher at the outbreak of the monsoon when there was little or no futures trading than when there was substantial futures trading. As a result, the range between the highest and the lowest seasonal index numbers was only 9.79 during years with futures trading as against 14.94 during years with little or no futures trading.. The impact of futures trading on seasonal variations of groundnut prices after the onset of monsoon has likewise been noteworthy. With futures trading, the end-of-season price fall was considerably smaller than in the absence of such trading. Little wonder that between June and October, the range between the highest and the lowest seasonal index numbers was only 5.26 in the presence of futures trading as compared to 9.06 in its absence.

The standard deviations of the seasonal index numbers by time periods were as follows:

(i) Years with futures trading: 3.370

(ii) Years with little or no futures trading: 4.838

Evidently, the seasonal variations in groundnut prices were almost one and a half times greater in the presence of futures trading than in its absence. The conclusion is further reinforced by Table 3.8, again borrowed from Naik,[1] which shows the actual amplitude of seasonal indices in groundnut prices for each of the years under study.

The table vividly reveals that the seasonal amplitudes in groundnut prices were almost consistently less during years with futures trading than during years with little or no futures trading. Clearly, the smaller range between the highest and the

[1] A. S. Naik, "Effects of Futures Trading on Prices", Somaiya Publications, Bombay, 1970.

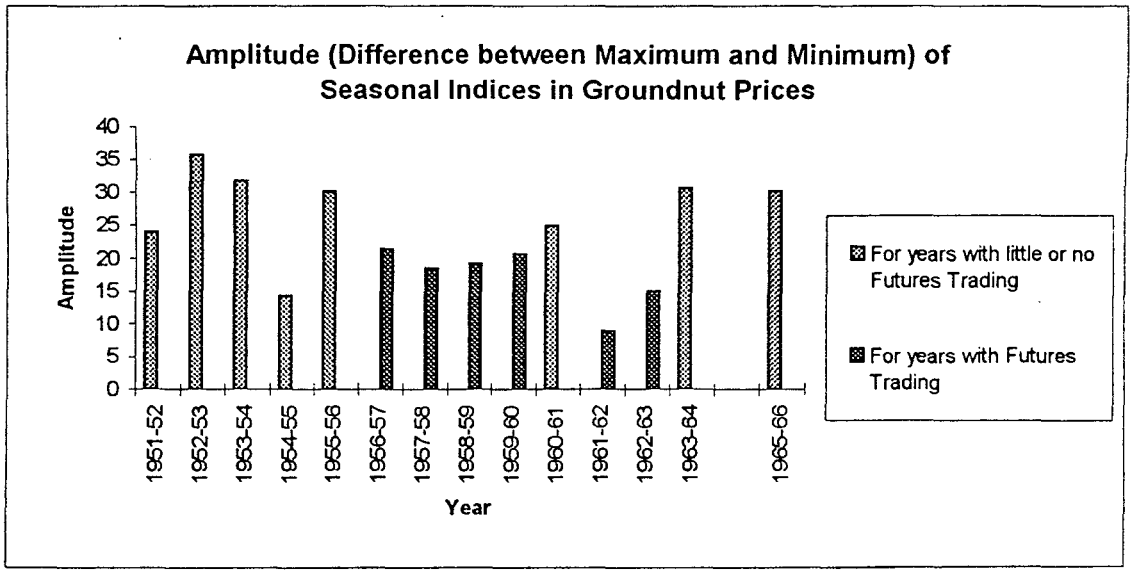
Table No. 3.8

Amplitude (Difference between Maximum and Minimum) of Seasonal Indices in Groundnut Prices

For years with Futures Trading		For years with little or no Futures Trading	
Year	Amplitude	Year	Amplitude
1956-57	21.38	1951-52	23.96
1957-58	18.33	1952-53	35.71
1958-59	19.17	1953-54	31.76
1959-60	20.59	1954-55	14.3
1961-62	8.85	1955-56	30.08
1962-63	14.93	1960-61	24.83
		1963-64	30.65
		1964-65	26.41
		1965-66	30.12
Average	17.2	Average	27.54

Source: A.S.Naik, *Effect of Futures Trading and price* , 1970

Graph 3.1



lowest seasonal index-numbers observed in Table 3.8 for years with futures trading, could not be ascribed to the mere averaging of the monthly indices of seasonal prices of several years.

Before the differences observed between the seasonal variations in the two time periods could be legitimately ascribed only to future trading, Naik checked such statistical comparisons against other available information and possible influences.

The other factors which were normally likely to have caused reduction in the seasonal price variations according to Naik were : "mainly three, viz., increased exports, improved financial position of growers and better storage facilities in the producing regions. During both the years with futures trading and without such trading, the export demand for groundnut as well as groundnut oil generally remained small and scarcely exceeded even 10 per cent of the total production. These other factors, therefore, did not add up to any logical explanation for the reduction in the seasonal variations of groundnut prices during the years of future trading. Such reduction, in the result, must be ascribed to futures trading which alone seems to constitute the distinction between the two periods."[1]

The effects of futures trading on the intra-seasonal price variations were assessed with the use of data relating to both monthly and weekly average prices. Naik ascertained the actual effects, by employing two methods. Firstly, coefficients of variations were computed for each year separately for both the monthly and the weekly average prices. Secondly, for an unambiguous comparison between years with futures trading and those with its absence, the coefficients of price variations for all years in each time period were pooled together to compute a single average coefficient of variation for all such years. The coefficients of variation in respect of both the monthly as well as the weekly average prices for groundnut were generally smaller for the years with futures trading than for the other years. Prima facie, therefore, it appears that the monthly and weekly average prices generally clustered around the respective season's average prices with the existence of futures trading, but were relatively more scattered in its absence. This view was further reinforced

[1] A. S. Naik, "Effects of Futures Trading on Prices", Somaiya Publications, Bombay, 1970.

when the different coefficients of variation were pooled together for individual years. Table 3.9 shows the values of such pooled coefficients of variation for groundnut.

It is apparent from the table that, on the whole, both the monthly and the weekly average ready prices of groundnut were relatively more stable around their respective season's average prices during years with futures trading than in its absence. Manifestly then, it seems that futures trading stabilises commodity prices, albeit moderately.

Naik made a more detailed analysis before giving a final verdict on the alleged stabilising (or de-stabilising) influence of futures markets. Excepting in the year 1954-55, all coefficients of variation of groundnut prices were invariably higher for years with little or no futures trading than for any of the years with futures trading. In fact, the coefficients of variation in the former period were almost twice as large as those in the latter period.

In the absence of any other characteristic feature distinguishing the two time periods, it is hard to think of any alternative explanation. Exports of groundnut and groundnut oil during both the periods were generally small and scarcely exceeded even 10 % of the annual groundnut outturn. In fact for years with little or no futures trading, the coefficient-efficient of weekly price variation was at its lowest at 5.35 in 1954-55 when India exported a record high of 164,000 tonnes of groundnut oil and the total exports of seed and oil in terms of kernels reached a record of 277,000 tonnes. In terms of supplies, 1965-66, a year without futures trading, was no doubt an abnormally bad one with a crop of only 28.16 lakh tonnes in kernels. But so was 1961-62, a year with futures trading , when the groundnut crop had turned out to be small for the third season in succession being only 32.80 lakh tonnes as against an outturn of 36.24 lakh tonnes during 1958-59. And yet, the dispersion of groundnut prices around the season's mean was almost three times as large in 1965-66 as in 1961-62. In fact, in two other years with futures trading viz., 1959-60 and 1962-63, the groundnut crop was very much less in relation to demand and still the coefficients of variation for both the monthly and weekly average prices of groundnut in those years were not higher than 6.

Table No. 3.9

Pooled (Average) Co-efficients of Variation for Monthly and Weekly Average Prices in Groundnut,Linseed and Hessian for the Years with Futures Trading and Years with Little or no Futures Trading

Commodity	For Monthly average prices		For Weekly average prices	
	For years With Futures Trading	For years With little or no Futures Trading	For years With Futures Trading	For years With little or no Futures Trading
1. Groundnut	5.57	9.51	5.15	9.57
2. Linseed	6.71	7.31	7.11	7.55
3. Hessian	5.86	7.24	6.08	7.17

Source: A.S.Naik, *Effect of Futures Trading and price,* 1970

Since all other groundnut seasons -- both with and without futures trading had normal crops and supplies, one could not resist the inference that futures trading had in fact reduced considerably the relative dispersion of prices of groundnut. This raises the obvious question : why, in its stabilising influence, was futures trading successful in groundnut. Naik's answer is : "it appears that with groundnut production having a distinctly seasonal character and its market arrivals less even and more concentrated during the months from November to February, the hedging use of the groundnut futures market for the purpose of carrying stocks and anticipatory requirements was probably quite high."[1] Of course, in the absence of any statistical break-up of the open position into hedge and speculative transactions , there was no easy way of proving this hypothesis.

Having covered the two commodities, viz., cotton and groundnut, with respect to futures trading in them, it appears that a contrasting note surfaces. While for cotton, there was a general bias against the short hedgers, with a marked backwardation in the futures prices but with no destabilising influence on spot prices; for groundnut not only a stabilising influence on spot prices was observed, but, it was also apparent that it benefited the hedgers (both short and long) with no bias against either class.

[1] A. S. Naik, "*Effects of Futures Trading on Prices*", Somaiya Publications, Bombay, 1970.

VIABILITY OF COMMODITIES FOR FUTURES TRADING IN INDIA

Given the benefits and costs associated with futures trading as discussed in the last three chapters, we now evaluate the commodities in India, where, futures trading if resumed, will play a net beneficial role. For this purpose, we again make a commodity specific analysis for cotton and groundnut. But before we proceed to do so, we briefly discuss the specific conditions required for a commodity where futures trading might play its desired role.

I) CONDITIONS FOR THE FITNESS OF A COMMODITY FOR FUTURES TRADING :

Not all commodities are fit for being traded in the futures markets.[1] To be capable of being traded in the futures market a commodity should be *homogeneous*, meaning that the units of the commodity should be interchangeable. The second attribute for futures trading is that a commodity should be capable of being *standardised* in one or more grades. Futures contracts do not mention particular grades and qualities but are executed in terms of a pre-defined standard grade so that other grades of the same commodity can be separated by a pre-defined premium or discount on the price contracted for the standard grade. It is yet another important characteristic for a commodity's capability for futures trading that its *supply and demand should be large* so that speculators with large financial resources are not able to obtain control of a substantial portion of it. The futures market for the

[1] J. B. Baer and O. G. Saxon, "Commodity Exchanges and Futures Trading", Madison : Harper Bros., 1948.

commodity , in other words, should be so large that the largest of speculators constitutes but a small fraction of the market in terms of the biggest purchase or sale he can effect.

It is also necessary that a commodity's supply and/or demand must be uncertain. When both the supply and demand are certain, prices get readily adjusted without the intervention of an organised market. When a commodity is subject to season-to-season and year-to-year variations in supply and demand, the problem of oscillation in prices, often resulting in high peaks and low valleys and the consequences of such peaks and valleys must engage the attention of the Government. Either the Government should then intervene with a full-fledged mechanism like price control and public distribution system (if the commodity is of obvious social significance) or instruments like forward trading have to be invoked, provided these instruments dampen the peaks and lift up the valleys.

Even when a commodity has fulfilled all these conditions, the organisation of futures trading in the commodity requires that the leading segments of the production and trade sectors are active participants in it to supply adequate quantity of hedging contracts. This along with operation of speculators, who come forward to assume the risk which hedgers desire to shift, should be large enough to make the market broad and liquid. In the absence of production and trade segments, only speculators would remain in the futures market and that would not be a healthy circumstance for futures trading.

Finally, a commodity must necessarily be relatively be free from substantial control either by a Governmental or public authority or a private organisation, cartel, association, corporation or individual. This means that in general the commodity should be able to flow to the markets freely and unhampered by interventions and restraints. Whenever for social or economic reasons a Government finds it necessary to ration, limit or regulate the demand for a commodity, or fixes a support price or procurement price and follows it up by a procurement operation or delivery quotas and a network of ration shops or distribution points selling limited quantities at fixed prices, the eligibility of a commodity for futures trading is destroyed. Thus the

Khusro Committee Report also recognises that "even though grains like rice, wheat, corn and maize are traded in several countries of the world on the futures markets, we cannot advocate a similar policy in this country, inasmuch as the important social requirement of providing grain in a guaranteed manner to low income consumers at a low price makes it necessary for Indian Government to operate a Public Distribution System in major foodgrains and makes it much less important, in fact unnecessary to operate futures markets in grains."[1] The Kabra[2] Committee's recommendations are also the same in respect of such commodities.

It is well known that in a relatively poor country like India, the basic and compulsive foodgrain requirements of the very large population with low incomes compels the government to intervene in the foodgrains markets and regulates foodgrains distribution through various devices. Thus in rice and wheat and some other foodgrains, there is a complex system of regulation and control involving the fixing of support prices, the procurement of grain, the provision of a large storage capacity, the operation, quite often, of a rationing mechanism and a vast network of public distribution agencies. This social necessity involves the government in a complex and costly distributive apparatus which ties up a great deal of governmental resources. It also involves the government in a huge amount of subsidy currently amounting to Rs. 5800 crore or so on the foodgrains account alone. Now, this machinery, expensive as it is, is likely to remain confined only to major necessities and cannot be repeated for commodities other than the most urgent ones.

It should also be noted that in the case of foodgrains the market in which demand meets market arrivals, is confined only to a certain proportion of the produce, say 40 %. The other 60 % or so is retained by the growers themselves for their own consumption. In the case of other agricultural commodities the case is entirely different and in most items almost the whole of production is for marketing. The futures expansion of volume is, therefore, going to be more rapid in those commodities which are marketed almost wholly and such an expansion will naturally

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[1] A. M. Khusro, Chairman, Report of the Committee on Forward Markets, Ministry of Civil Supplies, Govt. of India, June, 1980.

[2] K. N. Kabra, Chairman, Report of the Committee on Forward Markets, Ministry of Civil Supplies, Govt. Of India, February, 1994.

lend itself better to futures trading which requires larger rather than smaller volume for effective functioning. The expansion of the market size generally goes with the improvement in market sophistications and this too is a favourable circumstance for the operation of futures markets.

Once the application of the current mechanism of regulation, price control and distribution control to most other agricultural commodities is ruled out, the question arises as to what other methods would be used to regulate the prices of these other commodities. And many of these commodities are such that they exhibit a high degree of price fluctuations as in the case of pulses, groundnuts, other oilseeds, etc. A restraint somehow on their price fluctuation is necessary as much dislocation is caused by the upward and downward price movements. It is in this context of the impossibility of a complex control and distribution mechanism in most agricultural commodities that futures trading as a possible measure, in suitable cases, for dampening the peaks and lifting up the valleys of prices is to be considered and in some cases it may turn out to be a necessity.

II) PRICE TRENDS & SUITABILITY OF COMMODITY FOR FUTURES TRADING :

To assess the suitability of a commodity for futures trading based on price trends, where such price effects can have wholesome effects on production, trade and manufacturing, three cases need to be distinguished clearly :

Case 1 : -- Where there is no clear upward or downward trend in prices but prices fluctuate over the seasons and over the years, around an approximately constant average level.

Case 2 : -- Where there is an upward price trend and price fluctuates over the seasons and years around the rising trend.

Case 3 : -- Where there is a downward price trend and price fluctuates over the seasons and years around the declining trend.

It is the second case of a clearly established and discernible upward trend with seasonal and other fluctuations super-imposed thereon, which can be a matter of some controversy. In such circumstances when everyone is expecting a price rise, both trend wise and seasonally, it may be thought that there are no dissenting opinions. All opinions would seem to converge over a price rise. It is thought that under these circumstances if speculators entered the futures market they would also be buyers rather than sellers and their buying activity may further aggravate the price rise. The futures prices will then stand above the spot prices and would be rising over time. This, it is thought, will be a compelling force for further inflation of the commodity price and there will be no saving factors leading to a downturn of price. Thus an important body of opinion, in particular official opinion, stands in favour of banning futures markets under these circumstances.

The Khusro Committee Report also endorses this view by noting : "This opinion appears to have a good deal of weight and cannot be dismissed lightly. But then there are two types of sub-cases, in this major case, which need to be clearly understood. One sub-case is that, even when the overall price trend is upward, the seasonal troughs are also sizeable so that there could be a divergence of views amongst the operators with regard to the point of time when the trough would be reached and with regard to its level. The second sub-case is that not only the overall price trend is upwards, but the post-harvest lows are also very nominal so that there is a general convergence of views that the price trend would soon be upwards. In the first sub-case, futures trading has a role to play inasmuch as the divergence of views with regard to time when trough would be reached and with regard to its level could be fully exploited and the market got stabilised. In regard to the second sub-case, it would appear that, the general convergence of opinion being for an early resumption of the uptrend, when futures market is a narrow market with a relatively few operators, it is possible there are few or no dissenting opinions. In such a situation when buyers buy, they do so at a much higher price since the sellers are also expecting a higher price. In that case inflation can be aggravated. But it should be noted that the answer can also lie in having a larger rather than a smaller futures

market so that dissenting opinion is also held by a fairly large number of operators. Banning futures market at the slightest of inflationary provocation every now and then, restricts the size of the futures market and prevents it from growing into a large, competitive, diversified and resilient market. It can be conceded, however, that during patently inflationary situations both trend-wise and seasonally, of the second type, a narrow futures market provides a case for stopping futures trading at any rate for short periods. From a longer-time stand point, however, the enlargement of the futures market is the right answer to an inflationary situation."[1]

For the third case of a downward price trend with seasonal and other fluctuations superimposed is just the reverse of the second case. Here, too, if futures markets were narrow and all opinions converged towards a declining price expectation, prices would tumble rapidly as everyone would want to sell. However, we note again that where there are sellers, there must also be some buyers in order that sellers sell. Here, from a short period narrow stand point, the answer would seem to be a ban on futures trading. But here, too, the long-term and sensible solution lies in the enlargement of the futures market so that when numerous operators are behaving (selling) as though prices would fall a large number of dissenting buyers exists who counter the downward price tendency and vice versa.

Thus futures markets should be allowed to operate when there is no secular upward or downward trend in prices but only seasonal and other fluctuations exist. This matter has been taken up commodity-wise for detailed investigation for cotton and groundnut (especially because these are the two commodities where trade interests are clamouring for resumption of futures trading) in the subsequent section.

If the gains from futures trading accrued only to those who traded in the futures market and nobody else, or indeed, if the gains to futures traders were accompanied by losses to producers, manufacturers, consumers and other social interests, futures trading should not be recommended at all. It is a condition for what is called Pareto-optimality that some members of the society should gain from a given policy while nobody should lose. If it can be demonstrated that as a result of futures

[1] A. M. Khusro, Chairman, Report of the Committee on Forward Markets, Ministry of Civil Supplies, Govt. of India, June 1980.

trading the gains to traders co-exist with gains to growers, manufacturers and consumers, then a clear case for futures trading can be said to exist.

III) SCENARIO ON COTTON :

Among the different commodities recommended for futures trading by the majority report of the Kabra Committee, no one is perhaps more ideally suited for such trading than cotton. Cotton had a long tradition of futures trading in India, originating as it did soon after the war of independence in 1857. Futures trading in the commodity continued thereafter almost uninterruptedly for over hundred years, until it was suspended in September, 1966 in the fond hope of curbing the rising trend in prices. Since then, three decades have elapsed. Now trading in NTSD contracts in cotton is regulated all over the country under the auspices of nine associations. But neither have the cotton prices have declined, nor has futures trading still been allowed.

In the last two decades, the Indian cotton economy underwent a virtual metamorphosis. The production of cotton in the country has recorded a significant growth during the late 80s and the initial five years of this decade. The cotton production which remained around 5.74 million tonnes in 1972-73 rose to 7.53 million bales in 1982-83, and further rose to 12.3 million tonnes in 1995-96. From Table 4.1 and Graph 4.1[1] it is clear that the steady upward trend in production was achieved by a spectacular growth in yield (from 163 kg/hectare in 1982-83 to 260 kg/hectare in 1994-95) which in turn was complemented by steady rise in the coverage of area under irrigation.

After the partition of the country, about 40% of the cotton producing area was lost while the almost entire textile industry remained within India. As the domestic production improved, imports of cotton gradually declined and from 1978-79 onwards imports have been practically nil except contingency imports as in 1993-94. Overall, India has emerged as a net exporter of cotton.

[1] For Tables and Graphs on this chapter refer at the end of the text.

During the period from 1960-61 to 1978-79, India's exports fluctuated between 0.1 lakh bales to 4.3 lakh bales. In the subsequent years, India's export of raw cotton ranged from around about 2 lakh bales to nearly 7 lakh bales till 1985-86. During the season 1986-87, India's exports were as high as 30.7 lakh bales. The exports, however dropped in the subsequent years viz. 1987-88 and 1988-89 due todecline in raw cotton production following unfavourable weather conditions. During 1989-90 and 1990-91, exports of cotton have been to the tune of 13.7 lakh bales and 11.9 lakh bales respectively. During 1991-92, exports of cotton received a severe set back and were 0.8 lakh bales. During 1992-93, exports of cotton reached a high level of 13.77 lakh bales.

Table 4.2 and Graph 4.2 brings out the relation between production, export and domestic prices for raw cotton. All these variables are expressed in indices with the base year as 1981-82. It can be seen that through out the period, all the three variables fluctuated quite erratically, especially the wholesale price index for raw cotton.

The cotton prices, it has been observed, were subjected to wide fluctuations and generally ruled lower in the beginning of the season under the pressure of new crop cotton arrivals. During 1987-88 and 1988-89 in which the availability was less plentiful, the prices ruled at significantly higher levels than in 1985-86. During 1989-90 season, the prices of certain varieties of cotton eased by over 40%. The prices once again recorded a significant rise ranging from 53% to 94% during 1990-91, but ruled generally steady at higher levels in the subsequent 19991-92 and 1992-93 seasons. The prices have risen significantly during the next season. The wide fluctuations in cotton prices are mainly due to uncertainty regarding crop estimate, uncertainty about exports as well as imports. As we are moving towards globalisation, variations in demand and supply positions in other countries and fluctuations in international prices will also affect the price trend of cotton in our country. Volatility of price situation is therefore bound to be there, despite comfortable domestic situation.

It may be seen from Table 4.3 that the amplitude of price fluctuations was as large as 27% to 60% during 1992-93 in respect of major varieties of cotton.

That cotton prices vary widely not only from year to year, but also within each year, is quite succinctly brought out by Pavaskar in a recent study. Table 4.4, borrowed from his work presents the monthly average spot prices of J-34 (S.G) variety of 24 mm for the last ten years from 1984-85 to 1993-94. J-34 has been chosen just by way of illustration. What is true of J-34 is also true of all other varieties of cotton grown in the country. The instability in cotton prices essentially flows from the uncertainty, in its production. With not more than a third of the cotton cultivation under irrigation, it is not surprising that the cotton output varies considerably from year to year in response to the vagaries of weather and pest attacks. Juxtaposing the tables on production and prices, it is evident that prices and production are related inversely as expected.

As is known, cotton producers, merchants and stockists face risks of large value losses on their production, purchases and stocks from fall in prices. Likewise, exporters and spinners are exposed to heavy risks from adverse price increases on their overseas or domestic sale commitments of fibre or yarn for delivery at a later date. Price volatility, no doubt, also brings in its wake windfall gains to market functionaries. In the long run, such gains may even offset the losses from unfavourable price changes. But the losses when incurred are sometimes so large that they may even lead to insolvencies. As it is, the exposure of a market functionary to price risk is greater, greater is the share of the commodity in its earnings or production costs. Such is the case with the operations of cotton merchants and mills. Hence their need for price hedging through the use of commodity risk management instruments like futures contracts.

As with all farm commodities, so also in cotton, prices disclose a distinctly seasonal trend. To determine such trend in J-34 (S.G.) cotton prices, Pavaskar expressed the average spot price of each month in Table 4.4 as a percentage of the corresponding year's mean price. Such percentage relations for the ten years from 1984-85 to 1993-94 are presented in Table 4.5. The seasonal index for each month is

then computed as the arithmetic mean of all percentage relations for that month. The last column in Table 4.5 shows the seasonal indices so computed for the different months in a year.

The methodology applied by Pavaskar for computation of seasonal indices in Table 4.5 is, no doubt, more simplistic, than sophisticated. Thus, no attempt has been made in it to eliminate the long-term trend. For one thing, the available data was not permissive enough for adopting either 12 or 13 months moving average method. J-34 is invariably quoted for only 11 months in a year and not for all the 12 months. Moreover, it is not the purpose of this paper to present a detailed time-series analysis of cotton prices. Besides, growers, merchants and mills are more concerned with the prices they actually receive or pay, rather than the trend or inflation adjusted prices. In any case, since the inferences drawn in this paper are more indicative than quantitative, the simplistic approach suffices its purpose.

It is evident from Table 4.5 that seasonal index of J-34 (S.G.) cotton prices rises from 87.7 in November when the peak marketing season begins, to 114.9 in August when the cotton year ends. This seasonal trend represents a compound growth of 3% per month. Considering that the carrying costs in cotton amount to 2% per month, the seasonal band in cotton prices does not seem to be unusually large. Although this fact underscores the efficiency of the existing marketing practices of the cotton trade, there is no gainsaying the fact that with the functioning of a well developed futures market, the seasonal amplitude in cotton prices will tend to reduce to almost the actual amount of carrying charges, reducing thereby both the marketing costs and marketing margins.

The Kabra Committee Report considered the following aspects while deciding as to the question of introducing futures trading in cotton :-

(i). The supply of cotton has improved substantially during the last decade and there have been large carry-over stocks at the end of the seasons on a continuing basis. With the introduction of advanced technology in the cultivation of cotton, further increase in the cotton crop is likely in the coming years.

(ii). The internal consumption of cotton has not been commensurate with the increased production.

(iii). Exports of cotton have picked up faster during the last five years and is likely to show further progress in the future.

(iv). Cotton is marketed continuously throughout the season. So the merchants and their associates have to carry substantial stocks of cotton throughout the year till it is sold and have to bear the risk of price fluctuations.

(v). Despite the presence of CCI, MSCGMF and a host of co-operative agents, a major part of the marketing of cotton is still with the private trade. The facility of hedging is most required for the private trade as long as they play a significant role in the marketing of cotton. The state as well as co-operative agencies involved in the marketing of cotton could also use hedging facilities to minimise their risk from adverse price fluctuations.

Although the Committee, by majority view, recommends that futures trading in cotton be introduced in cotton in the various producing and consuming centres where functioning of a competitive market is possible, Prof. Kabra and Prof. Sen, however did not favour resumption of futures trading in cotton. Prof. Kabra is of the view that for cotton NTSD contracts, liberalised in terms of the Committee's recommendations, should suffice to meet the needs of the Price Risk Management for locking in prices and price discovery.

Table 4.6 presents data on quarterly price changes in J-34 variety of cotton for the period from 1984-85 to 1993-94. The quarterly period has been chosen as most merchants and mills hold stocks for three months on an average. Most NTSD contracts in cotton are also of three months' duration, though such contracts are permitted for a maximum of five months in advance of their maturity. Even export contracts in cotton and forward contracts for domestic sales of yarn and cloth are usually of about three months' duration on average. In any case, Table 4.6 and Table 4.4, (on J-34 ANNUAL PRICES) is only illustrative in nature and the pattern of price changes in cotton over shorter and longer periods is not far different from that observed in the table.

It is apparent from Table 4.6 that cotton prices decline as often as they rise. During the last ten years, prices fell over the quarterly periods as many as twenty times, and rose similarly the same number of times, which imply that the frequency of the risk of price of fall in cotton over a long period is the same as that of price rise. Obviously, despite the long-term rising trend in cotton prices, the need for short hedging is felt as often as that for long hedging. The rising or falling trend in commodity prices does not obviate the need for short or long hedging respectively. Ups and downs over short periods are unavoidable. These ups and downs necessarily involve price risks and affect adversely the market functionaries from both sides of the trade and industry.

It is also evident from Table 4.6 that most of the quarterly price changes in cotton exceeded 10%. In fact, price increases not infrequently exceeded even a much as 20%. Since cotton merchants and spinners operate on slender profit margins (not exceeding 3 to 4%), the incidence of price risks is obviously far too high for them to bear. The only inference that can be drawn is that in the absence of the futures market, they must be covering the cost of their price risks by paying less-than-fair prices to the sellers and by recovering more-than-normal prices from their buyers, raising thus their average margins. In other words, they recover from the producers and consumers the risk premium. In the process, they tend to also aggravate the price fluctuations in the market. Paradoxical as though it may seem, such a situation could be avoided by opening futures markets in cotton, which would provide useful forums for managing effectively price risks and reducing thereby the overall marketing costs.

In order to boost the production of cotton, the Government have been announcing the minimum support price of cotton since 1975-76. The steady rise in the minimum support prices have been shown vividly in Table 4.7 and Graph 4.4. The support prices are fixed on the basis of the recommendations of the CACP. Further, in order to help farmers to obtain remunerative prices, the Government has also designated certain agencies like the Cotton Corporation of India (CCI) and the Maharashtra State Co-operative Growers' Marketing Federation (MSCGMF) to intervene in the market. Though the CCI and MSCGMF, which introduced the

scheme of Monopoly Procurement in 1972-73, have both been procuring cotton, their combined purchases do not exceed 30% of the total production. Moreover, these two agencies do not act in unison. Consequently, far from influencing prices, their fortunes in fact fluctuate with the movements of the market prices which are determined solely by the overall supply and demand conditions and the pace of market arrivals.

Clearly, to improve marketing and pricing efficiency, it is time for the authorities to revive futures markets in cotton. The need for such markets is all the more now, as the country has not only achieved self-sufficiency in the commodity, but the Government has also adopted a more liberal policy than in the past for its import and export. True, while imports have been brought under the OGL, exports are still subject to quotas. Nevertheless, exports exceed imports. Moreover, both domestic cotton production and consumption are rising from year to year. Even before the turn of the century, the country may reap a cotton harvest of almost 20 million bales. The marketing of such a huge crop calls for an efficient pricing mechanism and an effective organisation for management of price risks, which futures markets alone can offer.

At the same time to promote competitive efficiency in futures trading, it is necessary to ensure liquidity in futures markets. For that purpose, it is essential to develop relatively broad based futures contract for medium and long staple varieties of cotton separately.

Although unitary control through a single futures market at the national level is ideal for ensuring liquidity and averting manipulations, for a country like India where transport and communication systems still leave much to be desired, there seems need to have regional futures markets in cotton which is grown widely and in different varieties in several regions like the North, the West and the South. Each market may have one or two contracts, depending on the magnitude of the varietal differences in terms of quality and prices. For effective hedging, contracts should also be permitted for as many months as the marketing season may permit so that long hedgers can hedge in delivery months which coincide with the maturity of their

deferred delivery transactions in the domestic and overseas markets. That would also reduce the costs on transfer of hedges from one delivery month to another. Incidentally, simultaneous trading in different markets, different contracts and different delivery months would necessarily promote arbitrage, improve liquidity and bring about an inter-regional as well as inter-temporal price equilibrium.

GROUNDNUT

Although India has been one of the major oilseeds producing countries in the world, the total availability of edible oilseeds and oils have generally fallen short of domestic requirements. Till 1979-80, the production of edible oils in the country remained around 27 lakh tonnes while the demand rose from year to year to about 35 lakh tonnes. The shortfall in supplies were met by imports which went upto the level of 19.67 lakh tonnes during 1987-88.

To meet the increasing demand for edible oils as well as to keep edible oil prices in check, the country has therefore been resorting to imports of edible oils. With a view to increasing the production and productivity of different oilseed crops, the Government in April 1981 set up the Technology Mission on Oilseeds Production with a four pronged-strategy covering crop production, post harvest technology, farmer inputs and market intervention. The various schemes introduced under an integrated scheme by the Technology Mission along with substantial enhancement of their support prices to boost production paid dividends in 1988-89 when the production of major oilseeds rose to 18.03 million tonnes from 12.65 million tonnes in 1987-88, a major drought year. Total production as evident from Table 4.8 and Graph 4.5 showed a decline to 16.92 million tonnes in 1989-90, but recorded a steady increase thereafter reaching 21.48 million tonnes in 1993-94. As a result, the gap between demand and supply of edible oils in the country has narrowed down.

Accordingly, the per capita availability of edible oil increased gradually from a low of 3.2 kg. in 1960-61 to 3.8 and 5.5 kg. in 1980-81 and 1990-91 respectively. (Refer Table 4.9). For 1994-95, it stands at a high of 6.5 kg.

Groundnut is one of the major oilseeds produced in the country. Regulated futures trading was permitted in groundnut and groundnut oil. However, such trading has not been permitted in groundnut and groundnut oil from October 1965. Groundnut is widely recognised as the king among edible oilseeds in the country primarily on account of its substantial production and widespread usage in different parts of the country. Groundnut accounts for 38.56 % of total output of oilseeds crop (in 19994-95) followed by rapeseed/mustard which accounts for 27.45 %. Groundnut oil is grown in the country on 85 lakh hectares yielding on an average about 76 lakh tonnes of groundnut in shell. It accounts for about 40 per cent of the area under oilseeds cultivation. India's share of groundnut (in shell) in world production stands at 31.9 % for 1991-93 triennium average.

Traditionally speaking, groundnut, groundnut oil and its cake have a long history of forward or futures trading. Prior to the ban on futures trading in such commodities, the futures markets in groundnut were in existence at a number of producing and consuming centres in different parts of the country, such as, Bombay, Rajkot, Sangli, Latur and for groundnut oil at Bombay, Madras, Akola, Ahmedabad and Delhi.

Although there is some variation in the different varieties of groundnut grown, by and large, all these varieties are clearly distinguishable. As such, it is possible to formulate coherent futures trading contract/s for the different varieties. Groundnut is not immediately perishable and can thus be stored for a fairly long period. The same holds true, *mutatis mutandis*, in the case of groundnut oil.

The production of groundnut and groundnut oil in the country is fairly substantial and has averaged at around 8.5 million tonnes and 2.4 million tonnes respectively in the course of the last five years. Again the production of groundnut and groundnut oil is not confined to a particular part of the country. Although, groundnut is essentially a 'kharif' crop, is also grown as a 'rabi'/summer crop. This further ensures that there are adequate marketable supplies of groundnut almost throughout the year. As regard the demand for groundnut, in keeping with its status as a premier oilseed, the same is fairly substantial.

The groundnut production in the country which was 5.77 million tonnes during 1979-80 rose to 9.66 million tonnes during 1988-89. It however, subsequently fell to 7.76 million tonnes in 1993-94 (refer Table 4.10 and Graph 4.6). Similarly, the production of groundnut oil rose from 1.33 million tonnes during 1979-80 to 2.70 million tonnes during 1988-89. It was 2.22 million tonnes in 1993.94.

From Table 4.10 and Graph 4.6 it is apparent that such a leap in production was possible due to substantial increase in acreage, where the area under groundnut cultivation expanded from 7.17 million hectares in 1979-80 to 8.53 million hectares in 1988-89. However, in 1993-94, it shrinked to 8.38 million hectares due to substitution of other crops. Another crucial factor was that the coverage of the irrigated area under groundnut cultivation concomitantly rose from 12.1 % in 1979-80 to 18.6 % in 1988-89 and further to more than 20 % in 1993-94. As a result the yield. showed an impressive growth from 805 kg/hectare in 1979-80 to 1132 kg/hectare in 1988-89. In 1993-94, however, it slackened to 926 kg/hectare.

The government, on the advice and recommendations of the Commission for Agricultural Costs and Prices, fixes the statutory minimum prices of groundnut. Excepting this, the wholesale and retail trade in groundnut is left almost entirely to the private trade. Although public agencies like NAFED and the NDDB and a host of other state-run Corporations and Undertakings purchase and sell groundnut / groundnut oil., a major part of the marketing of groundnut and groundnut oil is left with the private trade. The NAFED and NDDB are vested with the responsibility for maintaining the stability in retail and wholesale prices of groundnut and groundnut oil through their procurement and market intervention operations. In fact, as can be seen from Table 4.11 and Graph 4.7, the minimum support price, as announced by the Government, was enhanced substantially from Rs. 315 per quintal in 1983-84 to Rs. 500 per quintal in 1989-90 and to a high of Rs. 860 per quintal in 1994-95, implying a rise of nearly 240 % over a period of 12 years.

Despite this, the price trend in these commodities, shows that there has generally been post harvest falls and lean period rise within a season. Such an intra-seasonal fluctuation in prices is evident from Table 4.12 and Graph 4.8, where the

highest and the lowest prices for groundnut oil as recorded in Bombay Oil and Oilseeds Exchange for the 1991-92 season is shown. The year 1991-92 chosen is as representative as other years as far as the intra-seasonal price fluctuations are concerned. The highest price for groundnut oil rose from Rs. 367 per 10 kg. in July 1991 to a high of Rs. 392 per 10 kg. in December 1991, and then started receding to a low of Rs. 322 in June 1992. From June 1992 again it showed an upward trend. The lowest prices also showed a similar trend. Thus, seasonal fluctuations in prices are quite discernible. But, what is more disturbing is that the volatility in the range between the highest and the lowest prices, ranged from Rs. 33 in December 1991 to Rs. 11 in June 1992. Within the season, the difference between the highest price (Rs. 392 in December 1991) and the lowest price (Rs. 310 in May 1992) was as high as Rs. 82 between a gap of six months.

Thus futures trading in these commodities need not be considered as incompatible; having regard to the advantages conferred by a futures market, such as. the availability of insurance against adverse fluctuations in prices, availability of competitive prices and the development of an integrated price structure. These benefits would also be available to these public agencies, which operate in the market for stabilising prices. It would also tend to reduce their operational costs to a significant extent as they would stand to gain considerably by the insurance cover offered by the mechanism of futures trading.

Since prices are the best barometer of the health of the economy, analysing the price trends of groundnut oil, which is the prime price setter for the entire group of edible oils, during recent years, we find that groundnut oil wholesale price at Bombay, has constantly been showing an upward trend. After touching a low level of Rs. 244 per 10 kg. in March-April 1993, to reach an all time high of Rs. 432 as on 5th August 1995, representing an overall rise of 77 %, or an average rise of 33 % on an annualised basis during a span of two years and four months. Considering that the general wholesale price index has recorded an average rise of about 9 to any 10 % per annum during 1992-95, the price rise in groundnut oil is indeed very disturbing, particularly when viewed in the context of the substantial imports of edible oils

effected during the year 1995, following the liberalisation of imports which have been mostly placed under OGL since March 1995. The prices of other edible oils have also followed suit, though to a lesser extent, ranging from 17 % in the case of sesame oil to about 28 % in the case of soyabean oil. This, in turn, reflects the strong consumer preference for groundnut oil in the face of increasing supplies of other edible oils *vis-à-vis* groundnut oil. This naturally continues to cause concern particularly because of the problem of heavy demand during the festival season is yet to be encountered. The hardening trend of international prices and the weakening of the rupee against the dollar, have created new impediments to imports of required quantity by making imports costlier.

While imports by the State Trading Corporation of India went up from 11.50 lakh tonnes in 1982-83 to 18.19 lakh tonnes in 1987-88, it fell to only 1.46 lakh tonnes in 1993-94, reflecting that we are zeroing in as a self-sufficient producer country in oil seeds. However, as seen from Table 4.13, in value terms, it increased from Rs 507 crores in 1982-83 to Rs. 1060.95 crores in 1987-88, while falling less than proportionately to Rs. 210.23 crores in 1993-94.

Despite the ban on futures trading, the spot prices of oilseeds continued to rise due to factors of supply and demand. To give an example in the case of edible oils the Government of India improved the supply position by sizeable imports of soyabean and Red Palmolin. The spot price of mustardseed at Delhi on 1st June, 1964, when futures trading was banned ruled around Rs. 112 per quintal. It has been rising since then and after 32 years on 31st March, 1996, its price had risen to Rs. 1150 per quintal, a rise of 1000 per cent. During the period of 32 years production of mustardseed in the country had risen from 9 lakh tonnes in 1964 to 60 lakh tonnes in 1996. Likewise the spot prices of groundnut kernel in Bombay had risen from Rs. 115 per quintal on 1st June, 1964, to Rs. 1750 per quintal on 31st March, 1996, i.e.a rise of 1500% in 32 years.

The volatile production and price trends for groundnut and groundnut oil during the last decade is shown in Table 4.14 and Table 4.15 respectively. Table 4.14 and Graph 4.9 shows the production of groundnut, groundnut oil and groundnut

oilcake increased from 5.12, 1.43 and 2.15 million tonnes in 1985-86 to7.5,1.68 and 3.0 million tonnes in 1992-93 respectively. On the other hand,Table 4.15 and Graph 4.10 juxtaposes the index number of production and price trends of groundnut from 1980-81 to 1995-96.

In fact, comparing the index number for groundnut with the base year as 1981-82, as computed in Table 4.15, the wild fluctuations in groundnut production and wholesale prices are superimposed with a rising trend in the prices. The price index rose from 97 in 1982-83 to 169 in 1987-88 before dipping to 155 in 1988-89 and finally skyrocketed to 330 in 1995-96.

It is reported that the groundnut crop in Saurashtra, the groundnut bowl of the country, might have suffered a sizeable setback in 1995-96 due to erratic and deficient rainfall in the region has aided and fuelled the bullish psychology in the edible oils market. All these developments have tended to aggravate the volatility of the sensitive market of edible oils. The relentlessly rising trend in edible oil prices since April 1993 reflects the growing shortage of edible oils. Once again, supply is lagging behind demand. The emerging imbalance in the supply and demand indicates that the momentum of unprecedented growth in oilseeds production witnessed during 1987 to 1992 has somewhat slackened and this underscores the need for concerted efforts to reverse the trend and put the oilseeds economy back on the track of fast progress. With population at over 92 crores and the per capita requirement of 7.5 kg. the total demand for edible oils may be estimated at nearly 7 million tonnes. While the Government has placed the total deficit of edible oils at about 0.6 million tonnes on the basis of the total indigenous supply of edible oils estimated at about 6.4 million tonnes, a large section of the trade places the overall shortage at as much as 1 million tonnes.

As India's edible oils demand is highly income elastic, it is estimated that with about 2 % growth rate of our population and to 3 to 3.5 % growth in per capita income, the growth in demand for edible oils, is likely to be 5 to 5.5 % per annum. This raises the question whether our oilseeds production is rising at a rate commensurate enough to match the growth in demand. Officially, the oilseeds

production has registered a spectacular growth in from the level of 12.6 million tonnes in 1987-88 to 22.5 million tonnes estimated provisionally for the year 1994-95, disclosing a quantum jump of nearly 78 % over the last seven years, or an average annual growth of over 8.6 % at compound rates. In other words, the growth in supply seems to be commensurate with the growth in demand. As against the provisional official estimate of about 22.5 million tonnes, the trade estimates of oilseeds production at slightly less than 20 million tonnes. Looking at the relentless up-trend in groundnut oil and other edible oil prices, despite sizeable imports of about 0.5 million tonnes by different agencies namely STC, NDDB and private trade during 1994-95, it appears that the trade estimates of oilseeds production is more realistic and nearer to the truth. If so, it seems that oilseeds production has remained almost stagnant since 1992-93 when it had touched the level of 20.1 million tonnes.

The stagnation in oilseeds production during the last three tears seems to be the result of the production stress syndrome which is quite a common experience after a spell of sustained high production growth. Therefore, looking to the past long-term secular trends in the oilseeds economy, not only there is no need to take an alarmist view, but following the successful pioneering efforts by the Technology Mission, the on going market oriented liberalisation policies and globalisation moves promise to unleash the vast untapped growth potential and productive forces and trigger another burst of rapid stride in oilseeds production. The stagnation in oilseeds production during the last two years could largely be attributed to vagaries of the monsoon and adverse climatic fluctuations.

Apart from the climatic fluctuations, the bane of the oilseeds economy is low yields. Despite the phenomenal performance in oilseeds production during the last seven years, our yields continue to be among the lowest in the whole world. To illustrate, as against India's per hectare yield of 850 kg., the world average yield is 1350 kg. per hectare. The main reason for India's backwardness on the productivity front is that nearly 80% of the area is still dependent on rains. Though, our per hectare yield in oilseeds crops at 850 kg. may not appear to be too low compared with the world average of 1350 kg. per hectare, the same is only one half to one third

of the yields in several countries. To illustrate, as against India's yield of 830 kg. for soyabean, the same in USA is 2810 kg. and in Canada 2740 kg. For groundnut, the corresponding figures are 680 kg. for India as against 1600 for China and 2240 kg for USA

Recapitulating the past positive achievements, we find that not only the acreage under Oilseeds cultivation has risen from 18 million hectares in 1980-81 to nearly 26 million hectares in 1993-94, representing a rise of 45 % but it is gratifying to note that the productivity has increased from about 14 % to nearly 22 % by 1994-95. Likewise, oilseeds farmers have risen to the occasion by increased application of farm and technological inputs like fertilisers, pesticides, use of hybrid and high yielding varieties of oilseeds and adopting improved farm and crop management and marketing practices.

The price of both groundnut and groundnut oil are subjected to considerable fluctuations. This being the case, there is every need for providing a risk cover to the trade, so as to insulate them from the losses arising out of the fluctuations in prices.

Futures markets through its hedging mechanism enable the stockists to protect themselves against possible fall in prices. Further, the availability of likely future prices of a commodity would be of help to traders and government agencies like NDDB and others for deciding upon their buying and selling operations, as also the quantum of stocks to be held. The Kabra Committee, therefore, by majority view, recommends that the Government should take immediate steps for resumption of futures trading in groundnut and groundnut oil at the major producing and consuming centres in the country. Prof. Kabra and Prof. Sen, however, do not favour such a step.

Having discussed the production and price patterns of cotton and groundnut we conclude that while there is a case for reviving futures trading in cotton in the face of a comfortable supply situation but accompanied with a marked volatility in its spot prices, the case for groundnut does not appear that strong. While the price volatility coupled with production uncertainty makes it imperative for the

Government to allow futures trading in groundnut oilseed only as a transitional step. Keeping in mind the sensitive weightage of edible oil in an average household's food budget, where it constitutes nearly 3.86% in the Whole Sale Price Index, it will be prudent to keep the ban on futures trading in groundnut oil till such time the country emerges as surplus producer and the benefits of futures trading in the groundnut oilseed seeps down also to groundnut oil as far as stability in its prices are concerned. Till such time, the Government might liberalise the NTSD contracts for Groundnut oil.

Table No. 4.1

All India Area, Production and Yield of Cotton

Year	Area (m hects)	Production (m Tonnes)	Yield (10 kgs/ hect.)	%Coverage Under Irrigation
1949-50	4.93	2.75	9.5	8.2
1950-51	5.88	3.04	8.8	8.2
1951-52	6.56	3.28	8.5	9.1
1952-53	6.36	3.34	8.9	8.5
1953-54	6.99	4.13	10	8.4
1954-55	7.55	4.45	10	9.8
1955-56	8.09	4.18	8.8	10.0
1956-57	8.02	4.92	10.4	11.0
1957-58	8.01	4.96	10.5	12.7
1958-59	7.96	4.88	10.4	12.5
1959-60	7.3	3.68	8.6	12.9
1960-61	7.61	5.6	12.5	12.7
1961-62	7.98	4.85	10.3	13.0
1962-63	7.73	5.54	12.2	14.1
1963-64	8.22	5.75	11.9	15.3
1964-65	8.37	6.01	12.2	15.5
1965-66	7.96	4.85	10.4	15.9
1966-67	7.84	5.27	11.4	16.1
1967-68	8	5.78	12.3	16.7
1968-69	7.6	5.45	12.2	16.5
1969-70	7.73	5.56	12.2	16.4
1970-71	7.61	4.76	10.6	17.3
1971-72	7.8	6.95	15.1	20.3
1972-73	7.68	5.74	12.7	21.0
1973-74	7.57	6.31	14.2	22.1
1974-75	7.56	7.16	16.1	22.9
1975-76	7.35	5.95	13.8	23.5
1976-77	6.89	5.84	14.4	24.6
1977-78	7.87	7.24	15.7	26.2
1978-79	8.12	7.96	16.7	27.2
1979-80	8.13	7.65	16	27.5
1980-81	7.82	7.01	15.2	27.3
1981-82	8.06	7.88	16.6	27.7
1982-83	7.87	7.53	16.3	29.0
1983-84	7.72	6.39	14.1	29.9
1984-85	7.38	8.51	19.6	28.5
1985-86	7.53	8.73	19.7	30.2
1986-87	6.95	6.91	16.9	31.1
1987-88	6.46	6.38	16.8	32.0
1988-89	7.34	8.74	20.2	33.0
1989-90	7.69	11.42	25.2	34.2
1990-91	7.44	9.84	22.5	32.8
1991-92	7.66	9.71	21.6	33.1
1992-93	7.54	11.4	25.7	-
1993-94	7.34	10.71	24.8	-
1994-95	7.9	12.1	26	-
1995-96	-	12.3	-	-

Source : Directorate of Economics and Statistics, 1995 and CMIE, July, 1996

Graph 4.1

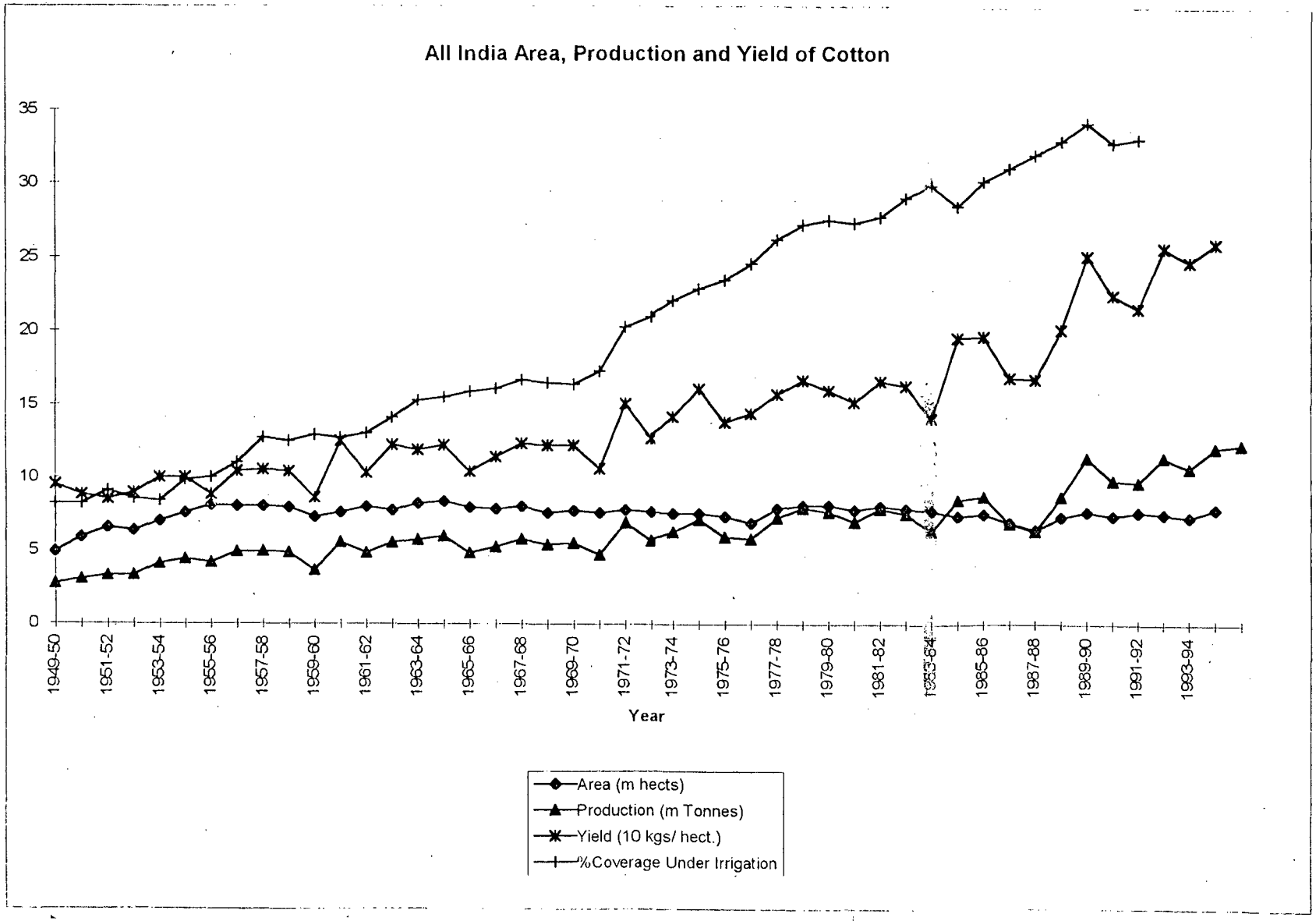

All India Area, Production and Yield of Cotton
35
30
25
20
15
10
5
0
1949-50
1951-52
1953-54
1955-56
1957-58
1959-60
1961-62
1963-64
1965-66
1967-68
1969-70
1971-72
1973-74
1975-76
1977-78
1979-80
1981-82
1983-84
1985-86
1987-88
1989-90
1991-92
1993-94
Year
Area (m hects)
Production (m Tonnes)
Yield (10 kgs/ hect.)
%Coverage Under Irrigation

Table No. 4.2

Index Number of Raw Cotton
(Base Year : 1981-82 = 100)

Year	Production	WPI	Export (Q)
1980-81	88.96	80.4	510.85
1981-82	100.00	100.0	100.00
1982-83	95.56	86.9	310.08
1983-84	81.09	100.2	201.55
1984-85	107.99	116.3	104.65
1985-86	110.79	95.2	114.73
1986-87	87.69	86.6	859.69
1987-88	80.96	133.4	291.86
1988-89	110.91	140.9	21.71
1989-90	144.92	146.9	81.78
1990-91	124.87	145.5	1428.68
1991-92	123.22	238.0	273.26
1992-93	144.67	218.0	165.12
1993-94	135.91	245.5	550.39
1994-95	153.55	388.3	85.27
1995-96	156.09	-	-

Source : Economic Survey, 1995-96.

Graph 4.2

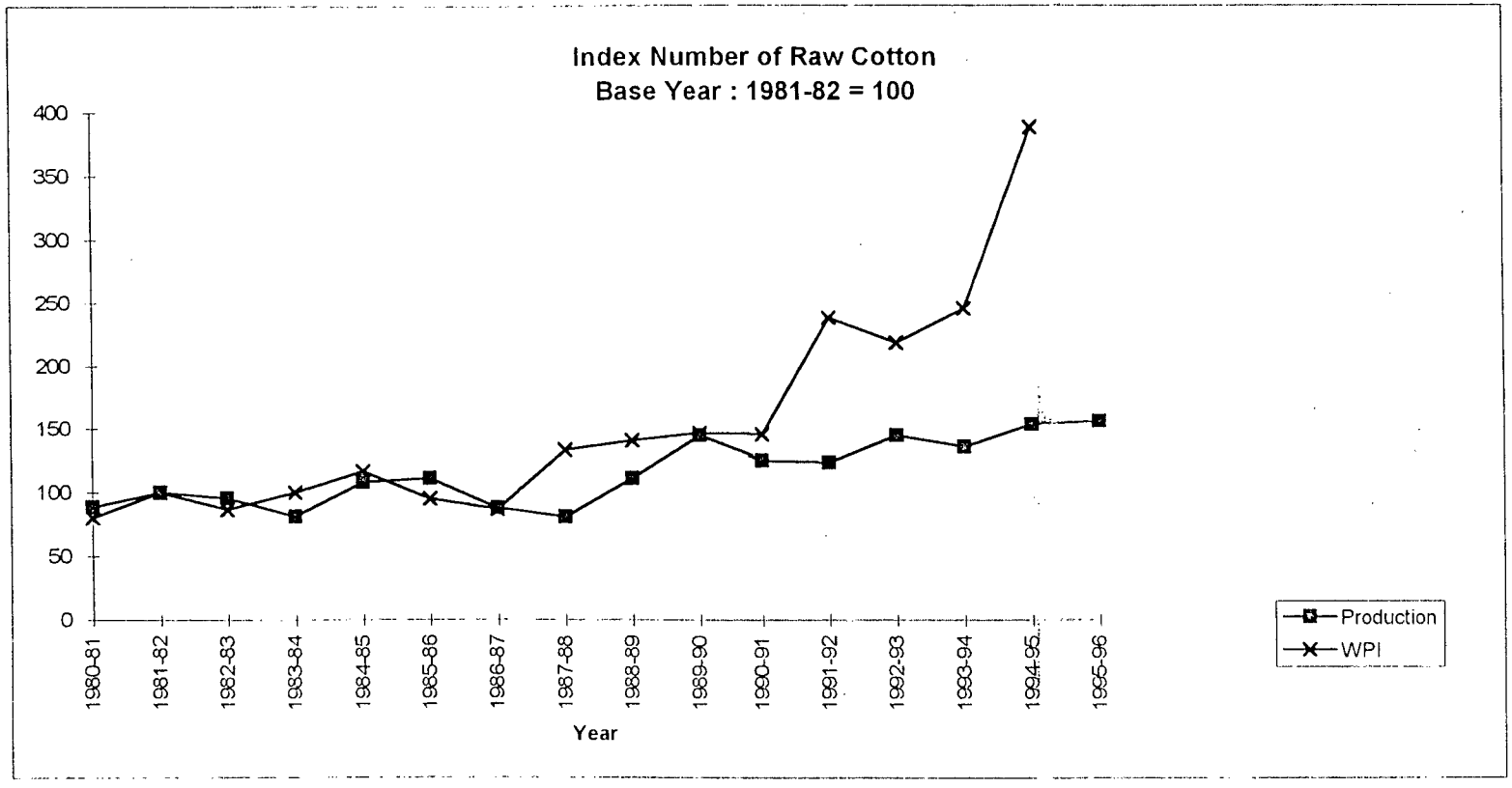

Index Number of Raw Cotton
Base Year : 1981-82 = 100
400
350
300
250
200
150
100
50
0
1980-81
1981-82
1982-83
1983-84
1984-85
1985-86
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
1994-95
1995-96
Year
Production
WPI

Table No. 4.3

Amplitude of Price Fluctuations
in Cotton Prices During 1992-93 Season (September - August)

Variety of Cotton	Maximum price touched during the Season (Rs. per Qtl.)	Minimum price touched during the Season (Rs. per Qtl.)	Amplitude of price fluctuation (%age)
R.G.J. 34	2812	1000	43.00
S.G.J. 34	3121	2067	40.63
V-797	2475	1800	31.57
Y-1/Jyoti	2812	2123	27.91
S.C.F. 414	4543	2432	60.53
Bengal Deshi fine	2292	1645	32.86
H-4 (C)	3515	2671	27.28
shankar-6 (B)	3937	2868	31.41

Source : The East India Cotton Association Ltd., Bombay, 1996.

Table No. 4.4

Monthly Average Prices of J-34 (S.G) Cotton : (1984-85 TO 1993-94)
(Rs. per quintal)

Month	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
September	-	-	-	-	-	-	-	-	-	-
October	1862	1300	931	1541	1734	1783	1859	2900	2698	2770
November	1632	1180	934	1500	1537	1771	2023	2753	2469	2821
December	1508	1142	1140	1825	1585	1696	2090	3033	2396	3272
January	1491	1150	1217	2175	1698	1715	2033	3284	2229	3477
February	1403	1123	1223	2134	1625	1641	2111	3363	2229	4165
March	1526	1042	1389	1976	1874	1490	2379	3128	2481	4952
April	1639	950	1476	1797	2026	1452	2796	3071	2643	5332
May	1576	1002	1515	1973	1971	1541	2906	3022	2715	5417
June	1497	987	1716	1958	1949	1709	3024	3217	2943	5467
July	1490	968	1820	1993	1938	1786	3272	3336	2959	5465
August	1444	960	2097	2026	2003	1776	3767	3152	3064	5236
Average of the season	1552	1073	1405	1900	1813	1669	2569	3114	2621	4398

Source : The East India Cotton Association Ltd., Bombay, 1996.

Table No. 4.5

Monthly Indices of Prices of J-34 (S.G) Cotton (1984 to 1993-94)
(Percentage Relation to the Mean Price of the year)

Month	1984-85	1985-86	1986-87	1987-88	1988-8	1989-90	1990-91	1991-92	1992-9	1993-94	Index of Seasonal Prices (Average)
September	-	-	-	-	-	-	-	-	-	-	-
October	120	121	66	81	96	107	72	93	103	63	92.2
November	105	110	66	79	85	106	79	89	94	64	87.7
December	97	106	81	96	87	102	81	97	91	75	91.3
January	96	107	87	114	94	103	79	106	85	79	95.0
February	90	105	87	112	90	98	82	108	85	95	95.2
March	98	97	99	104	103	89	93	100	95	113	99.1
April	106	89	105	95	112	87	109	99	101	121	102.4
May	102	93	108	104	109	91	113	97	104	123	104.4
June	96	92	122	103	107	103	118	103	112	124	108.0
July	96	90	130	105	107	107	127	107	113	124	110.6
August	94	90	149	107	110	107	147	101	117	119	114.1

Source : The East India Cotton Association Ltd., Bombay, 1996.

Table No. 4.6

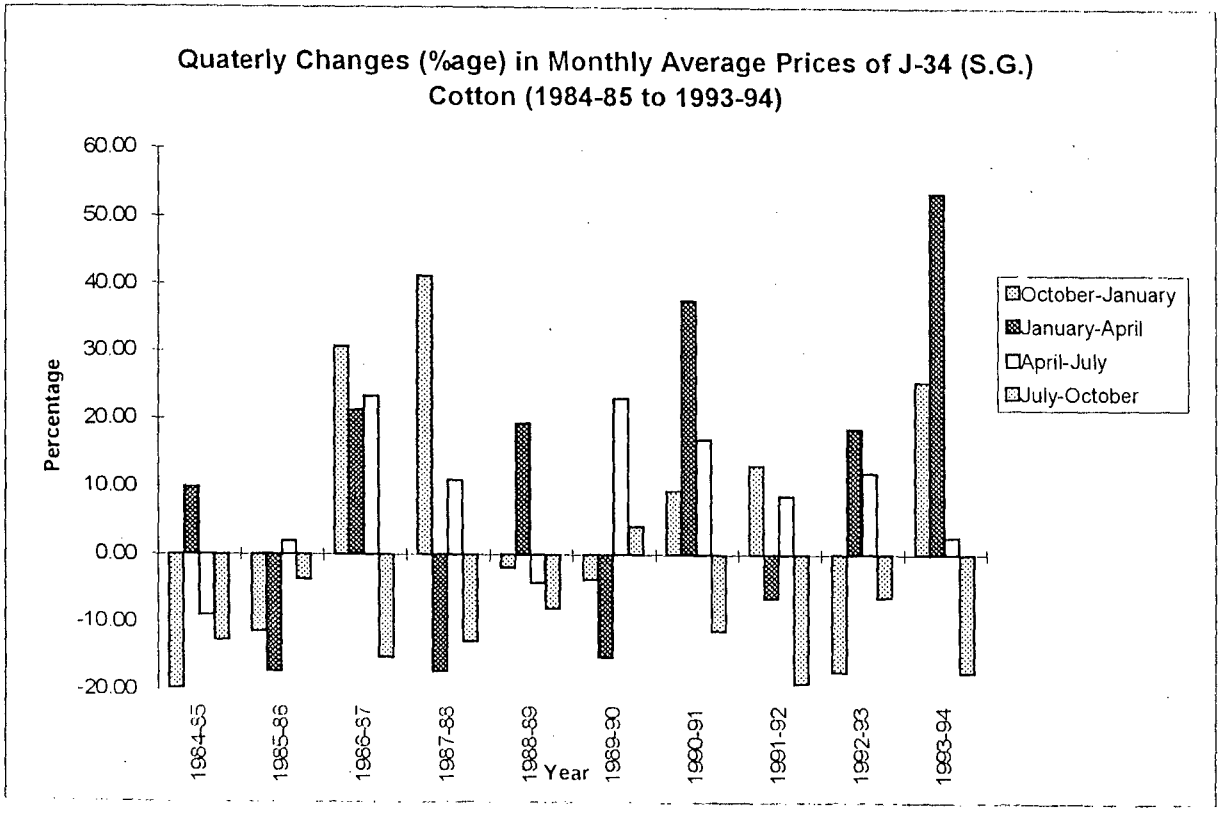
Quaterly Changes in Monthly Average Prices of J-34 (S.G.) Cotton (1984-85 to 1993-94)

Year	October-January	January-April	April-July	July-October
1984-85	-371	148	-149	-190
	(-19.9)	(9.9)	(-9.1)	(-12.8)
1985-86	-150	-200	18	-37
	(-11.5)	(-17.4)	(1.9)	(-3.8)
1986-87	286	259	344	-279
	(30.7)	(21.3)	(23.3)	(-15.3)
1987-88	634	-378	196	-259
	(41.1)	(-17.4)	(10.9)	(-13.0)
1988-89	-36	328	-88	-155
	(-2.1)	(19.3)	(-4.3)	(-8.0)
1989-90	-68	263	334	73
	(-3.8)	(-15.3)	(23.0)	(4.1)
1990-91	174	763	476	-372
	(9.4)	(37.5)	(17.0)	(-11.4)
1991-92	384	-213	263	-638
	(13.2)	(-6.5)	(8.6)	(-19.1)
1992-93	-469	414	316	-189
	(-17.4)	(18.6)	(12.0)	(-6.4)
1993-94	707	1855	133	-955
	(25.5)	(53.4)	(2.5)	(-17.5)

Note: Figures in brackets are percentages

Source: The East India Cotton Association Ltd., Bombay, 1996

Graph 4.3


Quaterly Changes (%age) in Monthly Average Prices of J-34 (S.G.) Cotton (1984-85 to 1993-94)
Percentage
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
1984-85
1985-86
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
Year
October-January
January-April
April-July
July-October

TableNo. 4.7

Minimum Support Prices Of Cotton

Commodity	Crop-Year	Variety/ Quality	MSP (Rs. per Quintal)
Cotton (Kapas)	1983-84	F-414/H-777	400
	"	H4	527
	1984-85	F-414/H-777	410
	"	H4	535
	1985-86	F-414/H-777	425
	"	H4	535
	1986-87	F-414/H-777	430
	"	H4	540
	1987-88	F-414/H-777	440
	"	H4	550
	1988-89	F-414/H-777	500
	"	H4	600
	1989-90	F-414/H-777	570
	"	H4	690
	1990-91	F-414/H-777	620
	"	H4	750
	1991-92	F-414/H-777	695
	"	H4	840
	1992-93	F-414/H-777	800
	"	H4	950
	1993-94	F-414/H-777	900
	"	H4	1050
	1994-95	F-414/H-777	1000
	"	H4	1200

Source : Directorate of Economics and Statistics, 1995

Graph 4.4

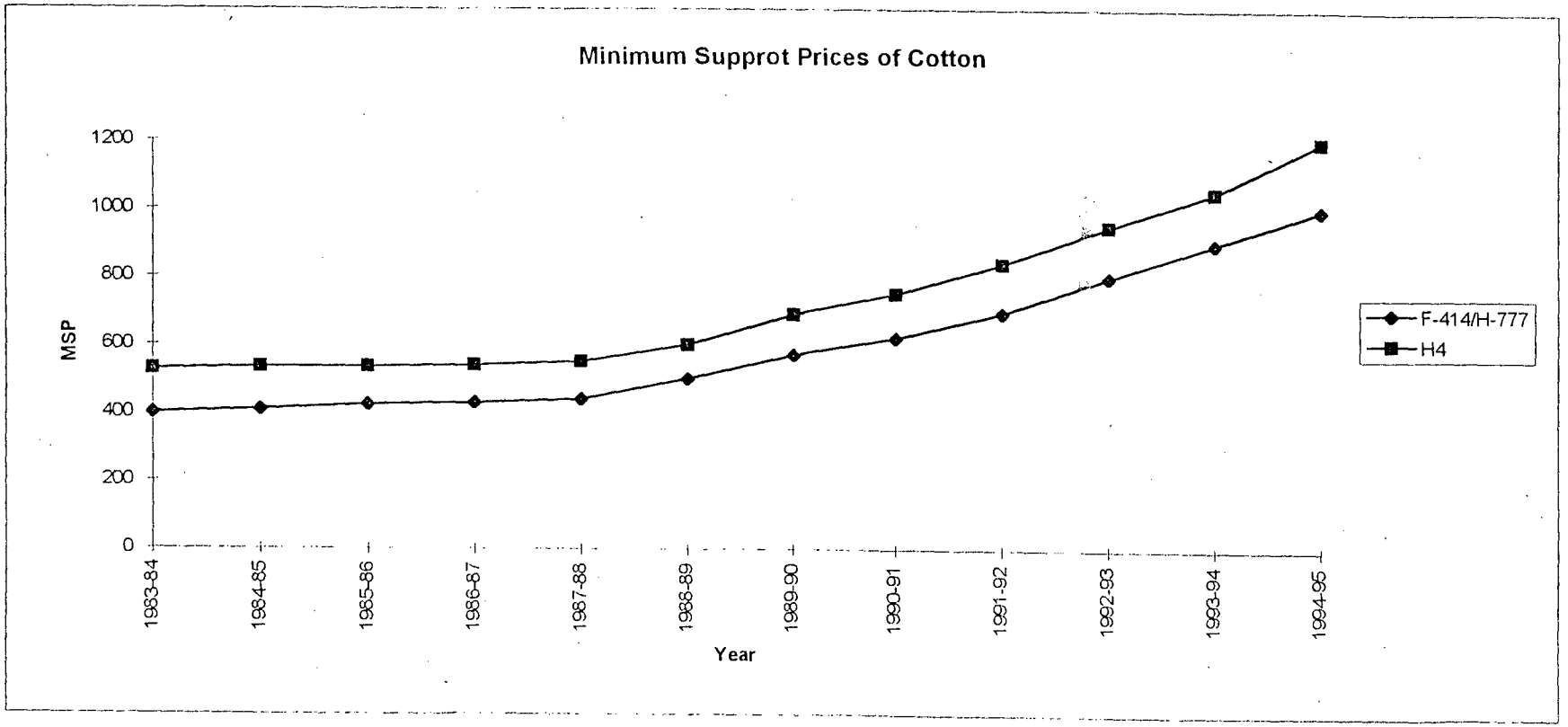

Minimum Supprot Prices of Cotton
MSP
1200
1000
800
600
400
200
0
1983-84
1984-85
1985-86
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
1994-95
Year
F-414/H-777
H4

Table No. 4.8

All India Area Production and Yield of Nine Oilseeds

Year	Area (m hects.)	Production (m tonnes)	Yield (100 kgs/ hect.)	%Coverage Under Irrigation
1952-53	11.18	4.73	4.24	0.80
1962-63	15.34	7.39	4.82	3.30
1972-73	15.79	7.14	4.52	7.20
1973-74	16.90	9.39	5.55	8.80
1974-75	17.31	9.15	5.29	9.20
1975-76	16.92	10.61	6.27	7.90
1976-77	16.47	8.43	5.12	7.60
1977-78	17.17	9.66	5.63	10.40
1978-79	17.71	10.10	5.70	11.00
1979-80	16.94	8.74	5.16	12.60
1980-81	17.60	9.37	5.32	14.50
1981-82	18.91	12.08	6.39	15.40
1982-83	17.76	10.00	5.63	15.60
1983-84	18.69	12.69	6.79	17.00
1984-85	18.92	12.95	6.84	19.60
1985-86	19.02	10.83	5.70	17.30
1986-87	18.63	11.27	6.05	17.90
1987-88	20.13	12.65	6.29	20.60
1988-89	21.90	18.03	8.24	22.30
1989-90	22.80	16.92	7.42	22.10
1990-91	24.15	18.61	7.71	22.10
1991-92	25.89	18.60	7.19	23.90
1992-93	25.24	20.11	7.97	-
1993-94	26.80	21.48	8.01	-

Source : Directorate of Economics and Statistics, 1995

Graph 4.5

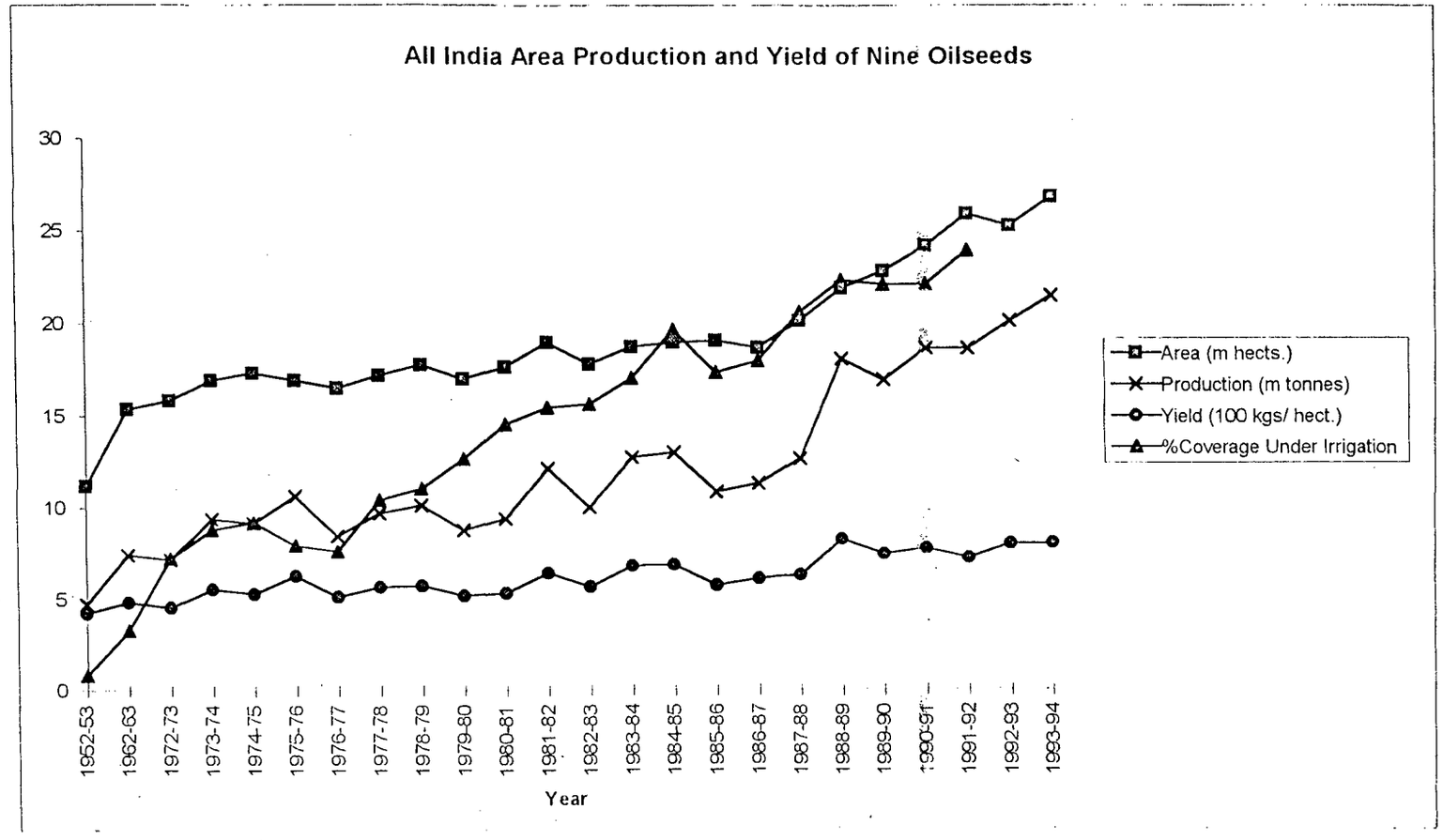

All India Area Production and Yield of Nine Oilseeds
30
25
20
15
10
5
0
1952-53
1962-63
1972-73
1973-74
1974-75
1975-76
1976-77
1977-78
1978-79
1979-80
1980-81
1981-82
1982-83
1983-84
1984-85
1985-86
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
Year
Area (m hects.)
Production (m tonnes)
Yield (100 kgs/ hect.)
%Coverage Under Irrigation

Table No. 4.9

Per Capita Availalibility
of Edible Oil

YEAR	Per Capita Availability (kg)
1960-61	3.2
1970-71	3.5
1980-81	3.8
1990-91	5.5
1994-95	6.5

Source : Economic Survey,
1995-96

Table No. 4.10

All India Area, Production and Yield of Groundnut

Year	Area (m hects.)	Production (m hects)	Yield (100 kgs/ hect.)	%Coverage Under Irrigation
1949-50	3.98	3.43	8.63	-
1950-51	4.49	3.48	7.75	-
1951-52	4.92	3.19	6.49	-
1952-53	4.8	2.93	6.11	1.2
1953-54	4.25	3.45	8.11	1.5
1954-55	5.54	4.25	7.66	1.7
1955-56	5.13	3.86	7.52	1.7
1956-57	5.53	4.37	7.83	1.8
1957-58	6.42	4.71	7.34	2.9
1958-59	6.25	5.18	8.28	2.5
1959-60	6.44	4.56	7.08	2.5
1960-61	6.46	4.81	7.45	3
1961-62	6.89	4.99	7.25	3.4
1962-63	7.28	5.06	6.95	2.6
1963-64	6.89	5.3	7.69	3
1964-65	7.38	6	8.14	2.9
1965-66	7.7	4.26	5.54	3.4
1966-67	7.3	4.41	6.04	4.8
1967-68	7.55	5.73	7.59	5.4
1968-69	7.09	4.63	6.53	5.1
1969-70	7.13	5.13	7.2	5.8
1970-71	7.33	6.11	8.34	7.5
1971-72	7.51	6.18	8.23	7.3
1972-73	6.99	4.09	5.85	6.6
1973-74	7.02	5.93	8.45	9.1
1974-75	7.06	5.11	7.24	8.2
1975-76	7.22	6.76	9.35	6.9
1976-77	7.04	5.26	7.47	5.9
1977-78	7.03	6.09	8.66	8.1
1978-79	7.43	6.21	8.35	9.6
1979-80	7.17	5.77	8.05	12.1
1980-81	6.8	5.01	7.36	13.3
1981-82	7.43	7.22	9.72	14.2
1982-83	7.22	5.28	7.32	14.8
1983-84	7.54	7.09	9.4	16
1984-85	7.17	6.44	8.98	16.1
1985-86	7.12	5.12	7.19	14.8
1986-87	6.98	5.88	8.41	15.1
1987-88	6.84	5.85	8.55	19
1988-89	8.53	9.66	11.32	18.6
1989-90	8.71	8.1	9.3	17
1990-91	8.31	7.51	9.04	18.3
1991-92	8.67	7.09	8.18	20.1
1992-93	8.17	8.56	10.49	-
1993-94	8.38	7.76	9.26	-
1994-95	-	8.26	-	-
1995-96	-	7.07	-	-

Source : Directorate of Economics and Statistics, 1995.

Graph 4.6

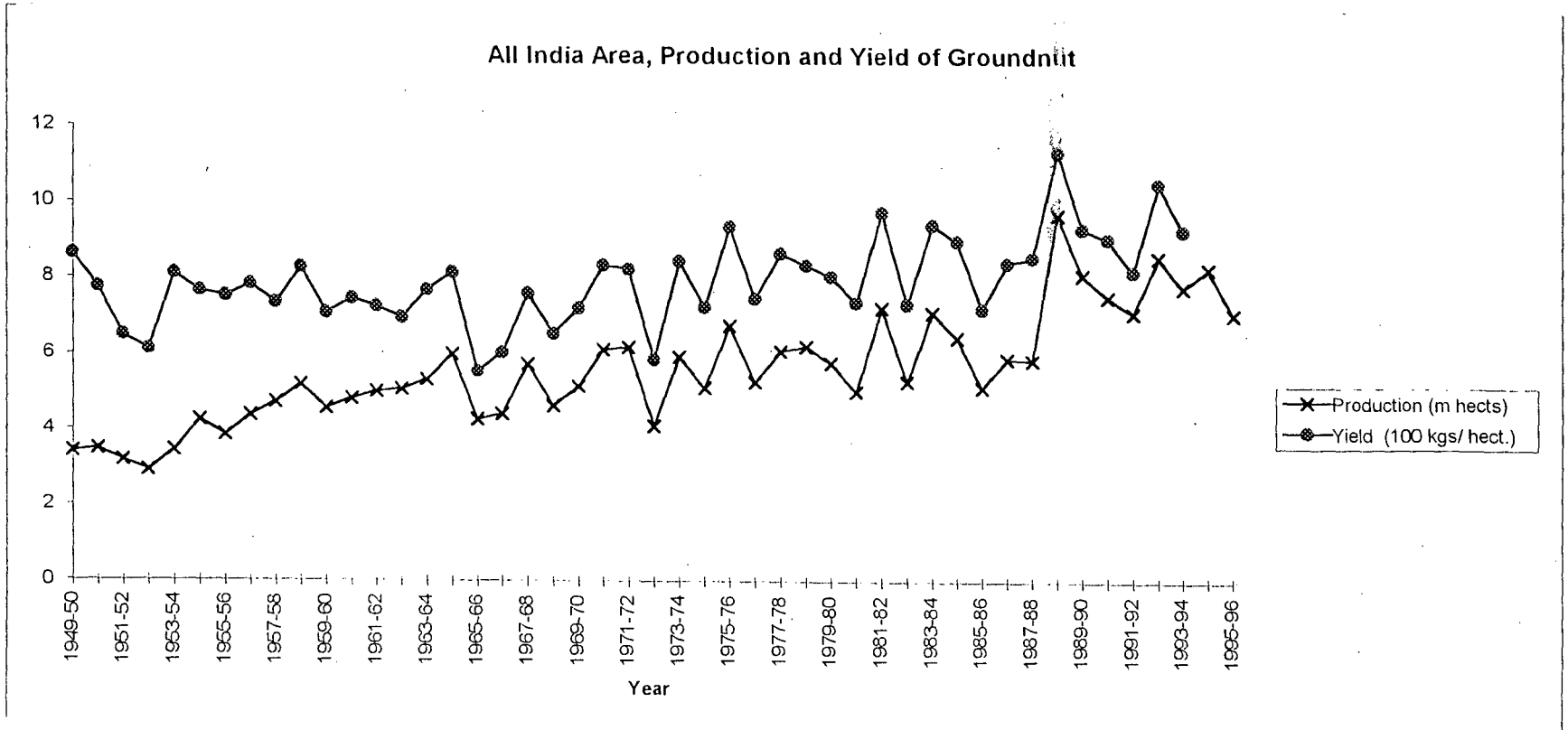

All India Area, Production and Yield of Groundnut
12
10
8
6
4
2
0
1949-50
1951-52
1953-54
1955-56
1957-58
1959-60
1961-62
1963-64
1965-66
1967-68
1969-70
1971-72
1973-74
1975-76
1977-78
1979-80
1981-82
1983-84
1985-86
1987-88
1989-90
1991-92
1993-94
1995-96
Year
Production (m hects)
Yield (100 kgs/ hect.)

Table No. 4.11

Minimum Support Price of Groundnut
(in Shell)

Year	MSP (Rs. per quintal)
1983-84	315
1984-85	340
1985-86	350
1986-87	370
1987-88	390
1988-89	430
1989-90	500
1990-91	580
1991-92	645
1992-93	750
1993-94	800
1994-95	860

Source: Directorate of Economics and Statistics, 1995.

Graph 4.7

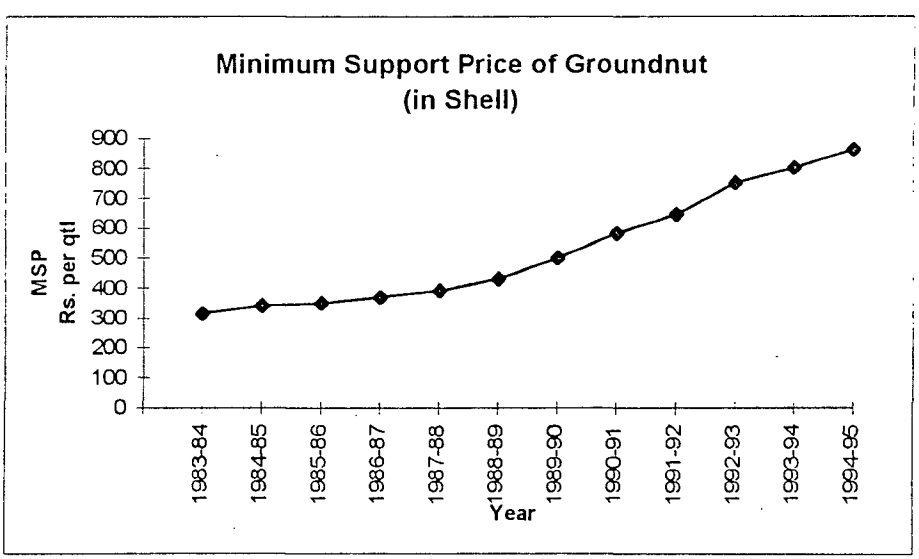


Table No. 4.12

Seasonal Price Trends of Groundnut Oil
(at Bombay, Rs. per 10 Kg)

Month	Price Highest	Lowest	Range
July 91	367	343	24
Aug	376	354.5	20
Sep	375.5	362.5	13
Oct	386	363	23
Nov	383.5	369.5	14
Dec	392	359	33
Jan 92	378	348	30
Feb	359	335	24
Mar	346	328	18
Apr	344.5	324	20.5
May	332.5	310	22.5
Jun	322	311	11
Jul	356	324	32
Aug	354	336	18

Source : Bombay Oilseeds and Oil Exchange Journal, 1993.

Graph 4.8

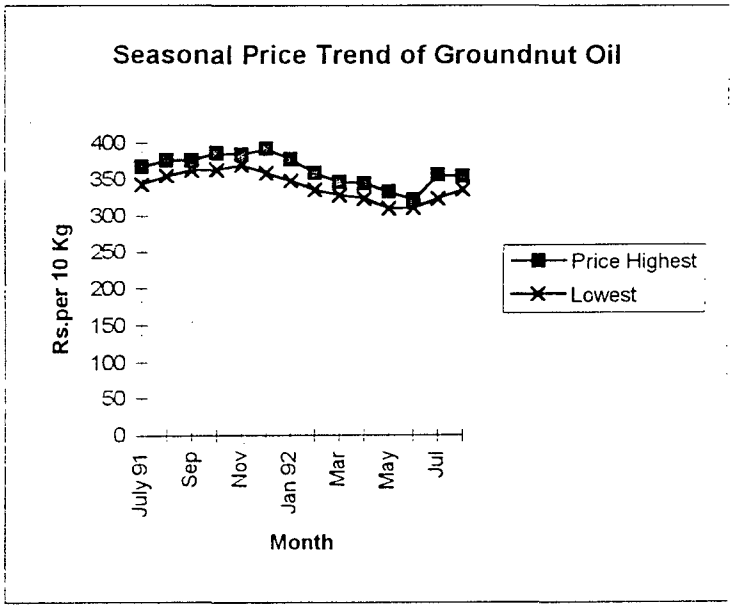


Table No. 4.13

Imports of Edible Oils by State trading Corporation Of India

Oil Year (Nov. to Oct.)	Quantity (lakh tonnes)	Value (in Rs. crore)
1982-83	11.5	507
1983-84	16.34	1310.99
1984-85	13.68	1122.13
1985-86	11.79	488.95
1986-87	14.97	667.67
1987-88	18.19	1060.95
1988-89	3.73	245.71
1989-90	6.07	328.82
1990-91	1.02	73.49
1991-92	2.15	178.13
1992-93	0.52	45.34
1993-94	1.46	210.23

Source : Directorate of Economics and Statistics, 1995.

Table No. 4.14

Production of Groundnut, Groundnut Oil, and Groundnut Oilcake (in m tonnes)

Year (Nov. to Oct.)	Groundnut	Groundnut Oil	Groundnut Oilcake
1985-86	5.12	1.43	2.15
1986-87	5.88	1.65	2.47
1987-88	5.85	1.64	2.46
1988-89	9.66	2.7	4.06
1989-90	8.1	2.27	3.4
1990-91	7.62	2.1	3.2
1991-92	7.1	1.59	2.84
1992-93	7.5	1.68	3

Source : Forwards Market Commission, 1993.

Graph 4.9

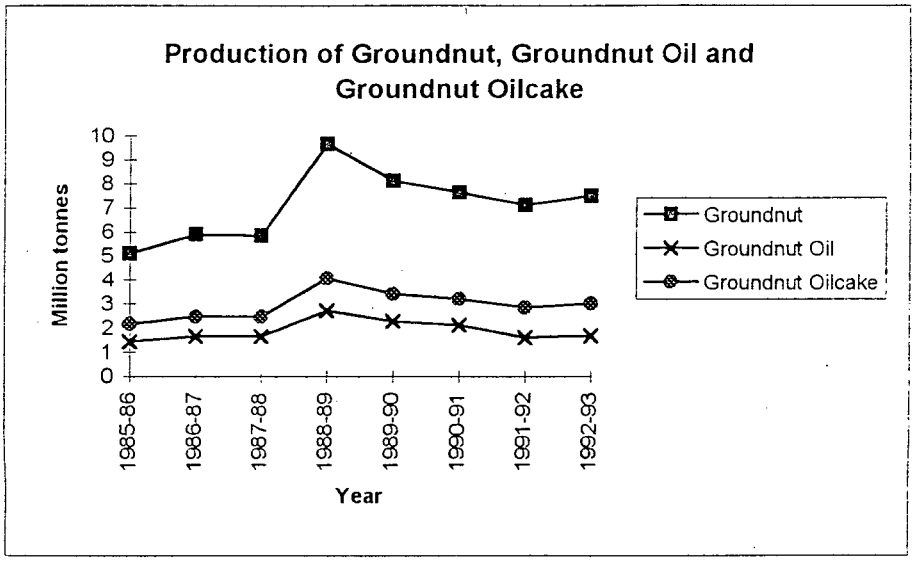


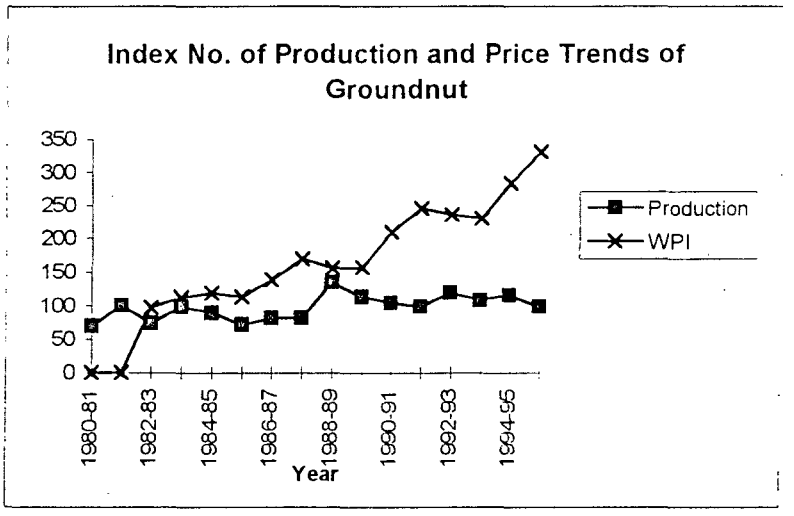
Table No. 4.15

Index No. of Production and Price Trends of Groundnut (Base : 1981 - 82)

Year	Production	WPI
1980-81	69.39	-
1981-82	100.00	-
1982-83	73.13	97
1983-84	98.20	111
1984-85	89.20	118
1985-86	70.91	112
1986-87	81.44	138
1987-88	81.02	169
1988-89	133.80	155
1989-90	112.19	156
1990-91	104.02	209
1991-92	98.20	245
1992-93	118.56	236
1993-94	107.48	230
1994-95	114.40	284
1995-96	97.92	330

Source : Economic Survey, 1995-96.

Graph 4.10



CHAPTER : 5

CONCLUSION

The economics of hedging and speculation in futures trading which has been discussed at length in the first chapter clearly brings out the advantage therein by locking in prices of commodities. The economic benefits of a hedge contract that accrue to the agents involved in the commodity is of crucial importance in the wake of a prolonged volatility of prices in the commodity markets and an economic order where domestic prices are gradually getting integrated with international prices and control over the farm sectors are gradually being dismantled. Needless to say such an era will be marked all the more by a volatile price structure. It is precisely where futures trading becomes a crucial instrument of locking in prices and ensuring the avoidance of losses to those agents involved in a particular commodity. Such an insurance is complemented with an inter-temporal adjustment in prices in both the ready and futures markets. This is achieved by evening out the fluctuations, i.e. dampening the peak and lifting the valleys in seasonal prices. Even intra-seasonal price fluctuations are considerably reduced. However, the very short-term prices, i.e. day-to-day and hour-to-hour fluctuations in prices, do increase as a result of futures trading. It is only the long term prices which futures trading cannot influence. Such prices are ultimately determined by the complex mechanism of the forces of supply and demand. The price signal benefit of futures prices also helps the different economic agents involved in a particular commodity for their planning process.

The inter-temporal adjustment in the inter and intra seasonal prices is of special significance in the case of agricultural commodities where the supplies are not continuous. The storage theory largely explains the built-in-mechanism for stabilising commodity prices. When supply is plentiful, the futures price invariably exceeds the ready price by an amount approximating to the cost of storage. This enables merchants to earn storage costs and encourages them to accumulate stocks. Consequently, supply is more evenly distributed over time, preventing a slump in

prices. On the other hand, when supply is scarce, the futures price falls below the ready price because the possession utility of the commodity (i.e., the convenience yield on storage) rises so much as to invert the normal storage cost. Such an inverse ready-futures price relationship discourages hoarding and inventory demand, and encourages merchants and manufacturers instead to make relatively cheap anticipatory purchases in the futures market. As such purchases transfer, albeit partially, the immediate effective demand from the ready market to the futures market, they help arrest the rising trend in prices.

Hedging will be attractive as long as there is a high degree of correlation between the ready and futures prices and the variability in the spot/ready prices is less than in the spread between ready-futures prices. An effective hedging mechanism entails a necessary condition where the positive(negative) spread between the ready and futures prices shrinks(widens) by the amount of carrying costs. To the extent such a relationship deviates, the distribution of profits and losses takes place among the short and long hedgers. However, to the extent there will be a reversal in such a trend, there will always be a class of hedgers who will profit in both the ready and futures markets at the cost of losses (in both the markets) incurred by the other class of hedgers. A prime example, of such a case was in the Indian Cotton Contracts where the short hedgers suffered loss in both the markets. Another necessary condition is that there is a high correlation between movements in the ready-futures prices. Such a phenomenon of bias against one or the other class of hedgers impairs the utility of the futures market for the hedgers.

However, any benefit accruing to a hedger by buying the insurance is associated with a cost in terms of a premium. While for a futures market it is necessary that there exists an excess return, whereby the risk takers are compensated for bearing the risk of hedgers, for professional speculators the risk premium demanded by them tends to be high when the futures market is thin. Studies do indicate that while for short horizon periods (less than three months) on an average there is no excess returns, there do exist excess returns in the futures markets for longer horizons. One plausible reason might be that the lack of liquidity in the far out

maturities make it necessary for the speculators to ask for an abnormal profit. In the presence of a time varying risk premia, the efficiency of a futures markets is diverse at best. However this necessarily does not imply a market failure or that the agents involved in a futures market does not act rationally.

The cost of hedging is inversely related to the volume of speculation. Speculation affects the cost of hedging in two ways. Firstly, with the large volume of trade resulting from speculation, the rates of brokerage and margin deposits tend to fall. This is because the risk of commission agents handling futures trading business is more widely distributed, among their clients, with large turnover than with small turnover. Secondly, and more importantly, with heavy speculation, and active competition resulting from it, the futures market is in a position to absorb a large volume of hedges, especially those that are not closed out, with less or little adverse changes in prices. As a result, the difference between the bid and asked prices tends to fall, reducing the transaction cost to the hedger.

Hedgers and speculators are not two mutually identifiable class of operators. A hedger can also become a speculator. They not only avoid risk but like entrepreneurs they will also speculate to make profit without taking heavy risk. One of the important pre-requisite of futures trading is price volatility in that commodity. Price volatility is the *cause* and not the *effect* of futures trading. It is the volatility in prices which induces the speculators to take risks from the hedgers in the hope of profit, thereby increasing liquidity which in turn increases the efficiency.

Although there has been a long standing debate whether futures trading is price stabilising or not, the present paper has sought to establish that if at all, there are quite a few reasons why they are not destabilising. Speculation in futures markets brings about an inter-temporal equilibrium in commodity prices and, as a result, reduces the frequency as well as the magnitude of price fluctuations in physical markets. It is only the very short-term price fluctuations that get aggravated with increased speculative activity (especially by scalpers) which in fact is a pre-condition for the speculators to enter a futures market. It should be noted that an even proportion of hedgers and speculators help to act as a cushion whenever there will be

a pressure on the prices for a commodity. However, the proportion of the volume of transactions between hedgers and speculators varies to a great extent between different markets and commodities.

Once the role of speculation is distinguished from that of gambling and manipulation, futures trading will be beneficial as an instrument of marketing and price risk management of commodities. Unlike speculators who assume risk which already exist in the market place, gamblers and those who wager create risks where none exists. While the success in gambling and wagering is a matter of chance, a speculator seeks to profit from the expected change in the futures price. At the other extreme, a manipulator attempts to profit by forcing a change in the futures price in the direction which is not justified by the underlying demand and supply conditions. However, it is often that there is a thin line distinguishing speculators from gamblers and manipulators. Where speculation ends manipulation begins. It is precisely there that the Government has to protect the interests of those who are affected in the process. It should consider ways of preventing manipulations and reducing their adverse impact on hedgers and small speculators, whenever they occur. After all, manipulation is an evil that distorts prices and impairs the utility of a futures market for hedging and price making. Even one individual like Hamanka, more popularly known as the "Five Per Cent Man" can cause havoc to the price structure of a commodity, the implications of which can be ominous for any trader in such commodities with a significant exposure.

The point has been made that professional speculators merely anticipate market movements and take risks with reference to these movements but do not actually cause them. It is however true that speculators can temporarily increase total demand when they buy and temporarily increase total supply when they sell but in the long run they neither increase nor decrease the supply or demand. It is this temporary distortion of supply and demand, which is the cause of concern for consumers and producers and particularly for democratic Governments. If however we look at the proposition that speculation is a leveller of prices in the medium and long term, we should also look at the conditions for ensuring this in the Commodities Exchange

administration as it is one of the essential requirements for orderly speculation trading. There is, however, another important requirement in the minimum volume of activity required in trading of any particular commodity which will minimise the adverse effects of speculation. Apart from the volume of trading activities, the velocity of trading would also have a bearing on the impact of speculative activities for good or bad. In a thin market, speculation can deteriorate into a gamble or manipulation and affect the credibility of the market itself.

In the Indian context, many committees have looked into many of these aspects and selectively recommended futures trading. But in a country like India with its continued dependence on the monsoon, the production increases in the last seven years when we had good monsoon, cannot be taken to be a secular trend. The recent memories of good agricultural production should be compared with earlier memories of fluctuations in production and shortage in many agricultural commodities. The question is how to protect the interests of the producers during good years and the interest of the consumers in bad years, and whether these concerns under both conditions can be effectively met through the system of commodity futures trading. Thus analysis has to be made for each commodity with reference to a swing in the areas of cultivation, assured irrigation, productivity increases and export markets. The role of the Government trading agencies and influences on them and their influences on market supply and demand will also have to be taken into account. Thus, unlike the Kabra Committee Report, which has recommended resumption of futures trading in a host of commodities ranging from certain edible oil like *groundnut* and *mustard oil* to commodities like *onion* and *silver*, a reassessment of the commodities should be done on the basis of the factors listed above whereby they satisfy the minimum self sufficiency in their production and a stable price structure. At the same time it should be recognised that in a country like India, where the structural reforms are still continuing, futures trading cannot be visualised as a substitute for stabilisation and support programmes. What futures trading, by itself, in suitable commodities, can hope to achieve is to give greater flexibility to the agents involved in a particular commodity. It cannot ensure a better price to the consumers

(especially in necessary commodities) and also to the farmers, who, are far off today to avail the facilities of hedging mechanism. Even in a country like the United States, the proportion of peasants are negligible who can make us of futures trading.

There is also a general agreement that an efficient organisational structure in commodities exchanges is essential to confine speculation and trading to those who are competent to fulfil contracts either to buy or sell. It is in the interest of the nation that the exchanges be professionally administered by the institutions and not by the brokers (as in the case of the three year old National Stock Exchange), as is the case with the much older exchanges. A great deal used to be said about the virtues of self regulation but it was thought that it had failed in the stock exchanges only in India. It is now generally recognised in India and even in the western countries that self regulation can only succeed under the close surveillance of a strong regulator who should be prepared to step in whenever self regulation becomes inefficient.

The public policy and laws concerning the regulation and control of forward/futures markets for the instruments of Price Risk Management (PRM) should reflect the overall economic goals and social priorities of the government. In India, it appears that the public policies and laws concerning forward/future markets have evolved with a view to serving the following objectives in varying limitations.

In so far as the economic entities resort to forward/future contracts in order to cope up with price volatility, public policies may aim at ;

(i) ensuring that speculation follows the rules of the game, does not involve too much of diversion of money/finance to sustain a bullish run on prices and thereby entail a heavy opportunity cost in terms of real, industrial investments foregone, and is able to prevent and eliminate the manipulation of market forces,

(ii) working towards greater transparency, accountability, flexibility in the form of course- correction in the functioning of futures/forward trading,

(iii) moving towards a realistic, enforceable form and extent of rule- based controls on non-spot contracts,

(iv) giving primacy to the needs and interests of those participating in actual merchandising *vis-a-vis* those who are purely or mainly speculators,

(v) moving towards exchange-based trading,

(vi) encouraging self-regulation, social accountability, transparency in the work of associations controlling and regulating forward/futures trading, and

(vii) special attention to the interests of small market participants, particularly small growers, processors and consumers.

Finally, we should try to do away with the regulatory system of imposing margins on open interest and likes. It is imperative for the Government to break up the total transactions into hedge and speculative positions. Such a step will make the watchdog organisation well equipped to keep track of situations where excessive speculation or manipulative tendencies are fostered. Moreover, the current daily trading limits for speculators (as in the developed countries) should be changed to daily limits on net position change. The present flat fixed limit on the number of contracts a speculator can trade during the day may actually cut back participation of speculators at the very time when they are most needed. On active trading days some speculators are forced out of the pit during the later hours of daily trading, thereby reducing liquidity. These daily trading limits are probably more binding on market performance than the speculative position limits. However when there is excessive speculation with the scalpers calling the shots to the detriment of small participants and hedgers, impositions of special margins on open interests in futures contracts, fixing limits on open interests and price fluctuations, prescribing minimum and maximum prices for trading in futures contracts, etc. Should be resorted to judiciously. Although these stipulations have impaired the utility of futures trading by distorting the price relationships, to check excessive speculation and manipulation these are the only weapons that the regulators can think of.

ANNEXURE : I

For understanding the mechanism and the rationale behind regulation of futures markets, it is necessary to understand the various types of instruments that are available for risk management and spell out clearly the distinction between the various types of contracts (instruments) with respect to their meaning, objectives and utility.

READY CONTRACTS

A ready contract also referred to as a "cash" or "spot" contract, is a contract where both the delivery and the payment are made either immediately or within a short period after the contract is entered into between the contracting parties. Most of the sale and purchase transactions, with which ordinary people are accustomed to and which they perform every now and then by paying for the goods almost immediately and taking the delivery of such goods soon thereafter, are ready delivery contracts. Under the Forward Contracts (Regulation) Act, 1952, (FC {R}) Act), a ready delivery contract has been defined as a contract where delivery and full payment thereof is made within 11 days from the date of entering into the contract. The ready delivery contracts are outside the purview of the said Act.

FORWARD CONTRACTS

The forward contract is a contract for the delivery of goods at a future date and which is not a ready delivery contract. It differs from the ready delivery contract in the sense that the length of time between entering into the contract and giving/taking delivery and making/receiving payment is more than 11 days.

In the marketing of commodities, it becomes necessary in many contracts to provide for delivery at a future date, with the period varying anywhere up to six months or so. The FC{R} Act distinguishes between two types of such delivery contracts, which are also known as forward delivery contracts, viz.,

(i) The Non-transferable Specific Delivery (***NTSD***) Contracts; and

(ii) The Transferable Specific Delivery (***TSD***) Contracts.

The Shroff Committee which scrutinised the draft Futures Markets (Regulation) Bill, 1950, had stated that Forward Contracts are mainly of three types: Futures contracts, TSD contracts, and NTSD contracts. Futures contracts have in practice certain distinguishing

characteristics of their own, though, in formal appearance, there may be very little to distinguish them from TSD contracts. The Committee felt, however, that if futures contracts were defined with reference to such characteristics, and the scope of the Futures Markets (Regulation) Bill, 1950, limited to such contracts, there was a possibility of TSD contracts being used as futures contracts for all practical purposes with a view to evading the law. Furthermore, the Shroff Committee's attention was drawn to instances in which speculation had reportedly taken place, or was taking place on the basis of the NTSD contracts.

(i) ***NTSD contract*** : In NTSD contracts, the terms of delivery and payment are specified before hand and delivery and full payment must occur between the original buyer and the seller. They are like ready delivery contracts used for merchandising, except that the duration is longer than 11 days. Thus, in a NTSD contract, neither the buyer nor the seller whose names are mentioned in the contract, can transfer their rights and liability to any third person.

(ii) ***TSD contracts***: In TSD contracts, the terms of delivery and payment are specified but the original parties can transfer their commitments and liabilities so that the actual delivery and payment is effected between the last parties. The TSD contract has all the features of a NTSD contract, except that it permits the parties to the contract to transfer their rights and liabilities under the contract to any third party. Such a third party, in turn, can transfer his rights or liabilities to someone else. This process of subsequent transfers can continue until the seller gives the delivery in terms of the contract.

Both the committees, Khusro and Kabra, on Forward Markets recognised the need to amend the definition of NTSD Contract to make it precise and to provide for certain facilities required by genuine trade. With the proposed change in the definition of the NTSD Contracts, the Kabra Committee felt that the trade should be freely permitted into NTSD Contracts. However, unlike the Khusro Committee, the Kabra Committee felt that the time limit for a ready delivery contract needs to be extended to thirty days. Such a recommendation was made after having regard to the fact that trade and commerce in a country of India's dimensions requires a sufficiently longer time to carry on their increasing pace of activities, especially so in the current liberalised economic scenario.

ANNEXURE : II

LIQUIDITY

Liquidity, that is a high volume of transactions and a large number of participants, is an essential condition for the proper functioning of organised futures exchanges. If the trade in a futures contract for certain contract month is liquid, those wishing to buy or sell can trade easily at little cost, i.e., the difference between the price paid for a contract and the price that would be received for selling it (the bid-ask spread) is minimal. If the trade in such a futures contract is not liquid, transactions cost include a high bid-ask spread, manipulation of prices is easier and, as there is little competition, prices offered may not reflect economic realities. Markets that are liquid, or "deep", can easily absorb large offers without prices being unduly affected. In a market that is not "deep", large-scale hedgers have to space their transactions carefully to prevent unnecessary losses. A market that is liquid can be used easily for hedging purposes; a non-liquid market should only be used when knows how to devise a strategy that takes the lack of liquidity into account. Another advantage of a high degree of liquidity is that speculators do not make systematic profits at the cost of the hedgers.

Lack of liquidity is more a problem for commodity futures contracts than for currency or interest rate futures contracts. The volume of trade in practically all commodity futures, especially for further-out months (beyond six months), is not very high. The daily turnover on most commodity futures markets, even the most liquid ones such as those for crude oil, is such that it will strain the capacity of these markets to the utmost if, for example a leading producer decides to use futures over a short period to manage the price risk of a substantial proportion of its output. The existence of a properly regulated market is no guarantee that it has sufficient liquidity to be able to handle medium-to-large-sized orders without suffering substantial price swings. This severely limits the efficiency of hedging operations and affects the representativeness of price discovery. Large commodity producers, traders, consumers and others wishing to lock in prices may react by moving into the over-the-counter market, by using the market to a lesser extent than they would have wished, or by adopting sub-optimal strategies (taking positions over a longer time period, taking positions

in nearby contracts and rolling these over, or taking positions in "parallel" contracts, which exposes them to additional basis risks).

Price discovery can also be negatively affected when a few market participants, account for a substantially larger amount of business than the other participants. These very large market participants may then feel tempted to affect prices through squeezes or similar forms of market manipulation. A different situation may arise when the traded commodity represents a minor part of input costs of firms using the commodity whereas it represents a major source of revenue for many exporters. These consumers may then not use futures contracts to any great extent because they can fairly easily outweigh even substantial unfavourable price movements on the markets by relatively small adjustments in their processing margins or sales prices. Trading could then be unbalanced with sellers relying on non-trade-related participants or trade houses to take opposite positions. This could affect the participation of all groups because of a perceived lack of connection of trading to supply and demand conditions.

Commodity buyers and sellers wish to operate in markets with high volumes of turnover. This coincides with the desire of commodity exchanges to increase profits by promoting market turnover. Efforts to increase the role of speculative finance appear useful as they increase liquidity. But for that a major precondition is there should exist volatility in prices to lure the speculators to make profit from price differentials. However, if there are many users with solely non-trade-related interests relative to those with commercial interests, the expectations of these users may unduly influence price determination.

ANNEXURE : III

CONTRACT DESIGN

Two opposing forces influence contract design : *standardisation* versus *market depth.* Market participants would prefer the commodity underlying a futures contract to be clearly and narrowly defined, as it happens in the *over-the -counter* (**OTC**) markets, where contracts are tailored to the needs of the transacting parties. However, a narrowly defined contract, while useful to certain participants, may fail to attract sufficient participants to provide a deep and liquid market. A deep and liquid market is desirable for two reasons : first, to permit secondary market trading "in size" to be carried out with relatively little impact on price; and, second, to limit the possibility of corners or short squeezes.

A corner or short squeeze arises when sellers of a futures contract cannot acquire the underlying commodity for delivery. If the commodity is narrowly defined, it is possible for someone to monopolise the supply of the commodity. If that individual also purchases futures contracts on the commodity, a corner results---the individual owns or has a claim on more of the commodity than is available. If the contract is broadly defined to allow delivery of various related underlying commodities, control of the deliverable supply is much more difficult, and corners and squeezes are much less likely. If a narrowly defined underlying commodity is in large supply, the futures contracts can be narrowly defined. However, if the supply of a single grade is not large enough or if a single delivery location is not convenient enough , futures contracts are broadly defined to allow delivery of several grades at several locations.

Most futures contracts must make provisions for the following features : (i) maturity months; (ii) contract size; (iii) method of contract settlement; (iv) grade of underlying commodity; (v) point of delivery; and (vi) time of settlement at maturity.

(i) Maturity Months

Too many maturity months reduce the depth and liquidity in any one month. Too few maturity months reduce the usefulness of a contract. How these conflicting objectives are balanced depends on the underlying commodity. It is worth noting that the number of days until maturity of a particular futures contract is changing as the maturity date is approached. This is contrast to various forward contracts, whose quotes are for new contracts originated on that day.

(ii) Contract Size

Contract sizes vary considerably and are chosen to meet the needs of the users of the contract and the intrinsic character of the commodity.

(iii) Method of Contract Settlement at Maturity

Most contracts are settled by delivery at maturity. Should a contract be carried into the delivery month, certain rules and procedures govern delivery. With futures contracts, the seller of futures (the short) may make delivery of the underlying commodity during a time in the maturity month specified by the exchange regulation. Delivery of tangible commodities may be made at any time during an extended period, such as two weeks, and usually takes the form of warehouse receipts giving claim to the commodity, which is stored at an approved location. The buyer of futures (the long) is obligated to take delivery if called upon to do so. The assignment of delivery notices by the exchanges take various forms. In some markets, the oldest long is assigned the delivery notice. In other markets delivery notices are assigned randomly. Futures contracts differ as to the flexibility remaining to the long after the receipt of a delivery notice. In some cases, usually in the tangible commodities, the long has the opportunity to pass the notice on to someone else and to liquidate the futures contract. The shorts usually have the greatest flexibility because they can choose the particular grade of underlying commodity that will be delivered as well as the exact timing of delivery.

Certain futures contracts call for cash settlement rather than delivery at maturity. The buyer of a cash settled futures contract, holding the position until expiration, receives the difference between the final settlement price of the futures contract and the price at which the contract was purchased. The final settlement price of the futures contract is the cash price of the underlying commodity. The seller of the futures contract receives a profit exactly opposite to that received by the buyer. Cash settlement is particularly useful when the underlying commodity is difficult to deliver.

(iv) Grade of Underlying Commodity

When the underlying commodity has differing characteristics, the futures contract specifies the standard grade of the deliverable commodity as well as the other grades that may be delivered. The choice for a particular grade of an underlying commodity to be delivered against a futures contract is left to the short, and the short naturally chooses naturally chooses the "cheapest to deliver". Indeed, the futures price at maturity reflects the price of the cheapest to deliver grade of underlying commodity, not necessarily the grade specified as standard in the futures contract. The cheapest- to-deliver commodity may hang during the

futures contract life. The exchange specifies the price relation between the deliverable grades prior to the start of the contract. As market conditions change, some grades go to a premium or discount relative to the standard grade.

(v) Point of Delivery

An important feature of futures contracts on tangible commodities is the number and the location of delivery points. Transportation of tangible commodities to delivery location might be costly. As a result, an increase in the number of delivery locations benefits the shorts who are obligated to deliver. To see this, suppose a wheat futures contract calls for delivery only in approved warehouses in Chicago. If wheat is in relatively short supply in Chicago, it is possible for someone to buy up most of the remaining supply while at the same time buying wheat futures contracts. Such an individual would have engineered a corner if the market did not have sufficient time to ship wheat to Chicago delivery location. As a result, it is sometimes desirable to specify several delivery locations in a contract, thereby making it difficult to corner the available supplies at all the delivery points.

(vi) Time of Contract Settlement at Maturity

Most futures contracts on tangible commodities allow a period of time in the maturity month during which delivery may be made. The seller usually has the option of when to deliver, what grade to deliver, and where to deliver. These features provide protection for the seller against the danger that someone may corner the available supply of the underlying commodity which must be delivered. When delivery is easy and the danger of a corner of the underlying deliverable supply is small, the time of delivery and other features, such as grade and location , are more narrowly prescribed.

ANNEXURE : IV

CLEARING HOUSE MECHANISM

Two institutional features distinguish futures from forward contracts. These features are margins and the clearing house. ***Margins*** are performance bonds that both buyer and seller deposit to the clearing house before trading. The ***clearing house*** is an adjunct to, or a division of, the commodity exchange through which transactions executed on the floor of the exchange are settled. Margins ensure, on a daily basis, that neither party has an incentive to default on the contract. The bond is renewed daily as open positions are ***marked to the market***, that is, gains (or losses) resulting from futures price changes are calculated for each contract and added to (or subtracted from) the initial margin. Should adverse price movements result in the initial margin dropping below the minimum level (minimum margin), a ***margin call*** is issued by the clearing house for a ***variation margin*** or additional funds to raise the deposit to initial levels. The ***minimum margin*** is the smallest allowable margin for the establishment of a futures position and is tailored to offset the maximum allowable price fluctuation during a trading day.

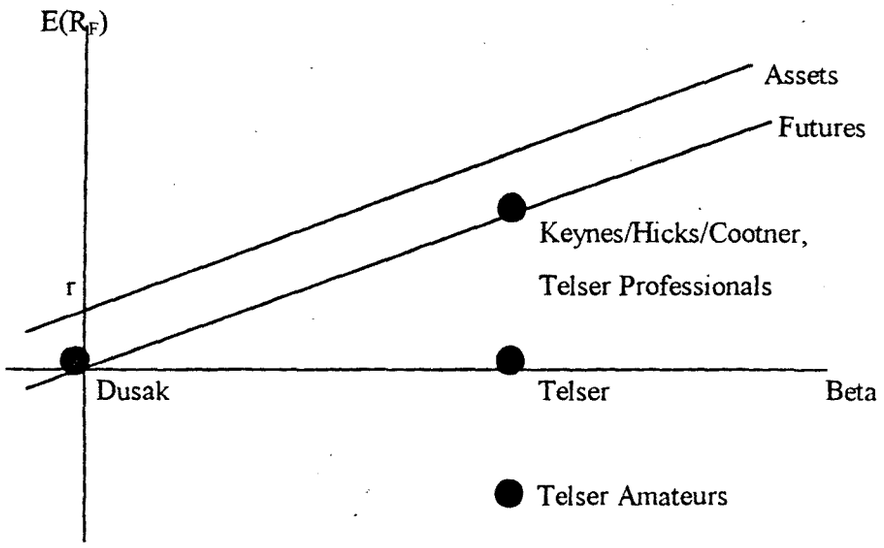
The ***clearing house*** acts as a third party to all transactions. Once a bid or offer is accepted, the futures contract is recorded with the clearing house and the clearing house becomes the opposing party to each contract. It assumes the selling position to each buyer and the buying position to each seller. Settlements by a clearing house enhances market liquidity by facilitating exit from the market and by depersonalising contract performance. It reduces the number of contracts which result in actual delivery of the physical commodity because traders are able to "close out" their contracts to sell (buy) by taking on an equal number of contracts to buy (sell). Such an offset trade leaves the trader with a zero net position with the clearing house. In summary, margins and the daily marking of positions to the market reduce the **risk of contract default to zero**. The clearing house, in acting as the third party to all transactions, establishes the principle of offset as a means of reversing a previous decision. Standardisation of contracts implies that for a specific delivery period, only the price is being determined. These features in combination have the synergistic effect of reducing the costs of entering and exiting from the market, permit centralisation of trading, and thereby greatly increase the liquidity of futures markets.

ANNEXURE : V

EQUILIBRIUM OF HEDGERS AND SPECULATORS

The equilibrium mechanism for determination of futures prices by hedgers and speculators is explained below. The figure assumes homogeneous expectations on the part of the hedgers and the speculators. Hedgers are distinguished from the speculators since they have a position in the underlying commodity. The HH schedule in the figure depicts the futures market position that hedgers as a group would like to hold for alternative futures prices. The hedgers would sell futures at prices below the expected spot price as shown by the HH schedule which crosses the vertical axis below the expected spot price because of the attractiveness of the risk transfer. The position of the HH schedule depends on the nature and the size of the underlying commitment. The slope of the schedule depends on the amount of price risk of the underlying commodity and the degree of risk aversion of the hedgers.

Figure A5 : Equilibrium of Hedgers and Speculators



The SS schedule depicts the futures market positions that speculators would accept for alternative futures prices. The SS schedule is downward sloping and intersects the vertical axis at the expected spot price. When the futures price equals the expected spot price, the speculator has no incentive to take a futures position ---- either long or short. When the futures price falls below the expected spot price, speculators earn a risk premium by taking a long position; and when the futures price is above the expected spot price, speculators earn a

risk premium by taking a short position. The downward sloping SS curve implies that a larger risk premium is required to induce speculators to take a larger position.

The equilibrium futures price, F_0*, determined such that the short position taken by hedgers equals long position taken by speculators. Speculators expect to receive a risk premium of $E_0(S_T) - F_0$*, and hedgers expect to pay that risk premium. Hedgers hold real assets (like wheat or common stocks) and sell futures to avoid risk. Speculators accept the risk; and, in return, earn a risk premium. Figure 4 is consistent with Keynes/Hicks/Cootner view and a CAPM in which the underlying commodity has a systematic risk. Under the Telser and Dusak views of speculators, the SS schedule would be perfectly horizontal and would cross the vertical axis at $E_0(S_T)$. In such a case, hedgers would receive insurance at no cost, and speculators would, as a group, not earn a risk premium.

It is possible that the risk premium is time-varying, particularly in agricultural commodities, which have a seasonal harvest cycle. In the case of a commodity like wheat, for example, hedgers might be long wheat and short wheat futures in the autumn after the harvest has come in, and they might be short wheat and long wheat futures in the spring when handlers of wheat make commitments to deliver wheat that they do not yet have in hand. In terms of the above figure, such a seasonal pattern would imply an HH schedule below the SS schedule in the autumn and an HH schedule above the SS schedule in the spring. In the autumn, speculators are long futures and $F_0 < E_0(S_T)$; and in the spring, speculators are short futures and $F_0 > E_0(S_T)$. Futures prices would display normal backwardation in the autumn when speculators indirectly bear the risk of the long positions in the commodity that has been harvested. In the spring, futures prices would display contango when speculators indirectly bear the risk of the short positions in the underlying

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