

# DETERMINANTS OF PRICES

A CASE STUDY OF AGRO-LINKED INDUSTRIES IN INDIA

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Price Theory lies at the base of economic theory. It is Price Theory which integrates and coordinates different parts of economic theory. Without a reference to price theory arguments may remain sterile, unconvincing or at times, even contradictory. "Light dawns, arguments fall into place as the propositions of price theory are brought into the central stage". It may be found empirically that what we are applying in nine cases out of ten is price theory (Townsend, 1971). Besides right from its inception till date an important feature of price theory has been that the received theory has been modified, extended and even discarded or replaced by new theory, if empirical realities have warranted that. Most of the new developments in the field of price theory have been prompted by the emergence of new forms of market structures and pricing practices thereof. Notwithstanding this, prices have remained among the emptier boxes of econometrics which could be filled up adequately only by more empirical research. This has been one of the motivating factors underlying the present study.

### **1.1 Differential Price Behaviour**

In the post Second World War period, an entirely new empirical reality has emerged. Inflationary pressures have been persistently in operation throughout the world economy. The received theory would make us believe that this empirical situation should be co-terminus with the upward phase of the cycle. However, a-priori no single phase of the cycle is expected to last as long as inflation has prevailed in the world economy during the post Second World War period. Not only this, the inflationary pressures had remained in existence

even when recessionary phase has emerged in the selected sectors of the economy. A very high degree of un or under-utilised capacities and high rates of unemployment have been the characteristic features of such sectors. These tendencies have been highly accentuated by the oil crisis of the early seventies.

The persistence of inflation in the midst of recession can not be explained by the classical propositions. Neo-classical formulations have come out abject croppers when they are put face to face with these empirical realities. Keynesian and neo-Keynesian postulates have also failed to go the roots of the problem. Macro-econometric models also dealing with prices or even pure price models tend to prove inadequate to grasp such empirical realities. This has given impetus to empirical research and the search for theoretical underpinnings and postulates.

## **1.2 Differential Price Behaviour and their Objectives**

Dichotomous behaviour of the sectoral prices highlights the need for having different price theories for the differential behavioural patterns. Means formulated a scheme of classifying prices into two categories during the thirties (Means, 1935). He distinguishes between the administered prices and the market dominated prices. According to him, those prices which depend upon the particular configuration of the forces of demand and supply may be designated as market dominated prices. As against this, administrative prices may refer to those prices which are insensitive to variations in demand. Thus, the dominant behavioural trait of these prices, may be their inflexibility even in the

face of marked fluctuations in demand. These prices are the ones that are made by the producers themselves. The power to determine the product prices is generally derived either from the monopolist or highly concentrated oligopolistic market structures. But Meansian concept of administrative prices is both narrow and broad in its scope. It is narrow as Means does not include the prices determined by executive or administrative orders in a socialistic or mixed economy having price controls in some or all sectors. It is broad in so far as the general concept of administrative prices being insensitive to changes in demand is concerned. In that case, both privately and publicly controlled prices would fall in this category. However, the price formation processes in private and public sectors may be distinctly different. While profit maximisation, either short or long run, may be the guiding force behind the privately administered prices, promotion of and/or welfare and growth may be the principles guiding and governing the publicly administered prices, and the price formation process would differ in accordance with the objectives underlying particular pricing policies. In case welfare is the guiding principle, one of the objectives to be realised from the fixation of price at a particular level will be to ensure a fair and equitable distribution of available output of a given good among the consumers with differential levels of purchasing power. The price and/or quantity controls will be explicitly designed in favour of the relatively weaker sections. The price may be determined on the basis of cost plus allowing reasonably satisfactory profit margin to the producer if growth is the dominant consideration. If equity in distribution and welfare are the dominant objectives of the policy, rigid price and quantity controls

may even be supplemented by subsidisation. In that case, the goods may be sold even at prices lower than the production cost though the difference may be paid to the producers as subsidy. In case long term stability and the promotion of growth of output are equally important objectives, then dual pricing may be promoted. One price may be administered while the other price may be left to be determined by the conditions of demand in the market. The administered price may be exactly tagged to the cost of production, allowing normal profits or even less than the cost of production, in which case it may have an element of subsidy. All such prices might remain out of Meansian domain of administrative prices. All the same, this provides a theoretical framework to understand differential behaviour of sectoral prices.

### 1.3 Behaviour of Flexible Prices

Numerous theories have already been developed for studying the prices of manufactures, which Means calls administrative prices. As against the Meansian framework, Hicks has put forward the dichotomous theoretical frame of flex and fix prices (Hicks, 1965). As all non-fix prices qualify to be called flex, this classification may also be found to be ambiguous. Therefore, we will like to divide prices into two broad categories - Inflexible and Flexible. Among the inflexible prices we will have both publicly and privately administered prices as discussed above. This group will be inclusive of Meansian administrative, other administered and Hicksian fix prices.

In the category of flexible prices, we may distinguish between three

types of prices :

a) Flexible prices that are determined in auction markets where a given quantity is offered for sale at a given point of time. The price is determined by the conditions of demand. The market would be cleared in the sense that the entire quantity offered for sale will be purchased. If, however, demand is sluggish, price bidding will be on the lower side, and in case of excess demand, price bidding will be on the higher side. The rise or fall in price will stimulate or depress the demand to a level where it just equals the quantity offered for sale.

b) The second type of flexible prices will conform to the neo-classical notion of equilibrium price. The excess demand, both negative and positive, would induce the price to rise or fall in the short run, but in the long run, the output would be fully adjusted to the conditions of demand with the result that prices would prevail at a level which clears the market, so that excess demand is eliminated and prices will generally converge to the long run cost of production. This may leave firms with only normal and zero abnormal profits.

c) The third flexible price may be defined as flex price where there is no market clearing mechanism of equilibrium in operation. The equilibrating processes will relate to stocks rather than flows.

#### **1.4 The New Phenomenon : Inflation in the Midst of Recession**

An economic system has been envisaged to depict cyclical changes. However, two phases of the cycle have mainly been focussed - upward and

and downward phases of the cycle. In the upward phase of the cycle, output, employment, prices and profits all rise together, till the end of the phase; whereas output, employment, profits and prices tend to fall continuously in a sustained manner over a period of time during the downward phase of the cycle. Inflation and depression are conceptually associated with these two distinct phases of the cycle. Therefore, the two phenomena cannot co-exist together at the same time. Inflation is defined as that state of an economy in which too much money chases too few goods as a result of which, the prices of various goods and services tend to rise. However, inflation neither refers to one time rise in prices nor does it reflect marginal or negligible rise in prices of a few commodities. It refers to the sustained rise in prices of most of the goods in an economy over a period of time. Continuous and sustained rise in the general price level may, therefore, be taken to be an indicator of inflation.

As against this, when the general price index falls continuously in a sustained fashion, this may be associated with the depressionary conditions in the economy. Recession, however, may be distinguished from depression. Whereas depression may encompass the economy as a whole, recession will be confined to particular segments of the economy. Falling demand leading to decline in output, un or under-utilised capacities and rising unemployment rates are some of the features characterising both recession and depression. The recessionary phases need not necessarily be associated with the falling prices, and hence falling profit rates.

During the entire post Second World War period, inflation has been the single most important problem confronting the world economy. It has naturally attracted the attention of both economists and policy makers. As stated earlier, inflation is defined as that state of an economy in which too much money chases too few goods as a result of which, the prices of various goods and commodities tend to rise. The general rise in prices thus leads to the persistent increase in the aggregate or general price level, which is commonly measured by an index number. Thus, conceptually inflation is a macro concept and it is embedded in the monetary theory. Naturally, most of the policy prescriptions, both conceptual and practical, had focussed on fiscal and monetary instruments designed mainly to contain demand through the management of money supply.

However, these instruments have often failed to contain inflation and have also resulted in reduced employment and output. The reason is that in the post Second World War period, inflationary pressures have persisted in the midst of recession in numerous economies. Thus, we have a new phenomenon of the persistent operation of inflationary pressures in the midst of un or underutilised capacities and the rising unemployment rates. Classical, neo-classical, Keynesian and neo-Keynesian propositions and formulations have been found inadequate to incorporate the phenomenon of recession in the midst of inflation. Macro-econometric models dealing with prices and pure price models have also been found wanting in this respect (Prakash, 1981).

Means (Means, 1935), as pointed out earlier, formulated a dichotomous

scheme of classification of prices in the late thirties which he attempted to use in sixties and seventies to explain the co-existence of recession and inflation in the US economy. According to him, "firms with market power, had a considerable degree of discretion over the price that they set. Consequently, they could raise prices even in times when demand conditions would mitigate against such behaviour, in the sense that a competitive market, characterised by free interplay of supply and demand would not generate those price movements. The motives behind these discretionary price rises could be to raise profit margins .... autonomous price increases of this nature meant that inflation could co-exist with recession for a prolonged period" (Domberger, 1983). He distinguished between the administrative and the market dominated prices. Prices which are determined by the market forces of supply and demand are designated as market dominated prices. As against these prices, there are administered prices which are insensitive to changes in demand. These prices are administered in the sense that the firms have got control over them and they are determined by their conscious and deliberate decisions. This power of regulating and controlling the price is derived by the firms from the market structure which reflects in the degree of concentration of the industry. These prices have a strikingly low propensity to change. These sectors are, by and large, characterised by oligopolistic competition. According to Means the behaviour of prices and wages in the administered sectors is essentially independent of the level of aggregate demand and these prices can, therefore, be treated as effectively independent of aggregate demand, monetary and fiscal policies. These prices are generally determined on a principle which is popularly

known as cost plus or mark-up rule.

### 1.5 Administered Prices

The coexistence of recession and inflation has been explained by Means in terms of what has come to be known as administered inflationary hypothesis, which relates to the process of adjustment of administered prices to changes in economic conditions. According to Domberger (Domberger, 1983) Meansian hypothesis of lag and catching up operation has also been rationalised by Ackley. According to Ackley (Ackley, 1959), the administered prices begin to rise under the impact of the vertical transmission of excess demand for the goods whose prices are market determined. Therefore, Ackley dismisses the popular distinction between demand pull and cost push theories of inflation and suggests that both demand and supply side factors represent interconnecting links in the mechanism that propels industrial prices persistently upwards.

It has not been possible to either refute or validate this hypothesis empirically irrevocably. The reason probably that the nature and scope of Means concept of market demand and administered prices are far too narrow in scope. It is a well known fact that rigidities may characterise both privately and publicly administered prices. The power of regulating and controlling the price is acquired by the private firms through their control over supply of output. For a public authority to have control and regulating power over prices, it is not necessary to be a producer of the particular commodities. The power of regulation and control may be acquired just by executive or legislative measures. In such cases, it is not necessary for the market structure to be

either oligopolistic or monopolistic. Public control over prices is possible through partial or total control over output as well. Unlike the privately administered prices, the objective of which is to maximise profits, the publicly administered prices may aim at welfare maximisation and/or growth promotion. The publicly administered prices may also be of two types: Those prices which are administered with a view to ensure that the total supply is fairly and equitably distributed among the different groups of consumers at reasonable prices. The objective may be attained by imposing quantity restriction on the purchases by individual consumer's and the imposition of a ceiling on the price level so as to ensure that the profit margins is well within the defined limits. This type of administered price may be arrived on the principle of cost plus pricing. Such prices may be comparable in essential features to privately administered prices. In order to promote the welfare of the consumers and as well as to ensure proper growth of the industry, the publicly administered prices may carry an element of subsidy either to the consumer directly or through the producer. In such cases, the actual sale price may be fixed below cost. These prices will have some features distinguishing them from the other two types of administered prices. Thus publicly administered prices are not independent of the tools and instruments of public policy. The regulation and control may be exercised through physical tools as well as by monetary and fiscal tools. Public utilities and a number of other goods and services may belong to these categories. In a mixed economy, the number of such sectoral prices may be even larger than the rest of the sectoral prices in the economy, and therefore, the propositions of Means may not be adequate to analyse inflationary pheno-

menon associated with the movements of such prices or such factors.

### 1.6 Rigid and Flexible Pricing

We would like to divide prices into two categories: inflexible and flexible. Rigid or inflexible prices will consist of four groups :

- 1) Unsubsidised publicly administered prices,
- 2) Subsidised publicly administered prices,
- 3) Privately administered prices, and

4) Meansian type administered prices, which may conform to collusive oligopoly market structure and the inflexible prices which in Hicksian terminology may be called fix prices. Market dominated prices of Means are associated with auction markets or markets having brokers or intermediaries, but the flexible prices, on a-priori consideration, may also belong to any one of the following categories :

i) Flexible prices that are determined in the auction market. Indian Tea Market is an example of this type of prices. The price in wholesale vegetable markets also conform to this.

ii) The neo-classical type flexible prices where the products of the firms are not differentiated and the market is not concentrated and the price in such markets may be determined by the simple market clearing mechanism where price fluctuations occur till the excess demand, either negative or positive, is completely eliminated. Some consumer goods market may conform to such conditions.

iii) The prices that, in Hicksian terminology, are defined as flex prices. This classification scheme is quite comprehensive and inclusive of practically all types of markets that may exist, either empirically or conceptually. Each group of these sectoral prices will have a structurally different behaviour pattern needing a different theory for its explanation which is empirically valid and consistent with the assumptions on which it is based. The theory has to be sound logically and it will have to take cognisance of the structurally different features of the different sectoral price movements.

### **1.7 Scope of the Present Study**

The present study is an attempt in the same direction, in so far as it seeks to identify the determinants of prices of agro-linked manufactures and evaluate their influence upon the level at which these prices prevail and the temporal changes therein.

It is important to point out here that the developing countries had been subject to ever deepening inflationary pressures even before this problem emerged in the developed world. In fact the various studies relating to the Indian economy show that inflation in the developing countries may be structurally different from that of the developed ones (Prakash, 1979, 1980, 1981a,b; Prakash and Goel, 1983). An important point here is that agricultural prices in general and foodgrains prices in particular lead in the process of price rise (Prakash, 1979, 1980, 1981a,b; Prakash and Goel, 1985; Mathur, 1975; Mathur and Prakash, 1980). Besides the inflationary pressures first originate in the agricultural sector, wherefrom they percolate to the rest of the economy.

The reasons seems to be the fact that the agricultural sector is the most dominant sector of the Indian economy both in terms of employment and output and it has close inter-relations with other sectors of the economy (Prakash, 1979, 1980, 1981, 1985, 1986, 1987; Prakash and Goel, 1982, 1983).

### **1.7(i) Behaviour of Agricultural Prices in India**

The agricultural prices behave in an unusual manner. Movements of agricultural prices cannot be explained in terms of the 'simple' demand and supply relations. Even when bumper crops are harvested prices instead of falling, remain stable or even rises. The phenomenon can be explained by a number of factors :

Firstly, there is a continuous rise in the population resulting in an ever increasing demand for foodgrains. Then there is also a rise in the income level of both the urban consumers and the rural consumers including farmers themselves. Besides this, as a result of a rise in the prices of agricultural products, the income of the farmers also go up proportionately. Then the pent up demand for foodgrains of the farmers suppressed for decades have suddenly got released because of considerable degree of prosperity in recent years. As a result of these factors, demand curve for foodgrains has been shifting to the right more rapidly than the supply function with the result that prices rise even in the years of good harvests (Mathur and Prakash, 1981; Prakash and Tripathi, 1981).

Another peculiar feature is that the Indian agriculture is dominated

by small and marginal farmers. Their sale of foodgrains, consumption and stocks are highly interrelated (Prakash, 1981a,b) and, therefore, all these components get determined simultaneously. However, it is the consumption rather than the marketed surplus which is treated as a residual by them. The reason is that the cash requirement is their first charge on the output of foodgrains, but the given cash requirements can be met by selling less at higher prices.

While more has to be sold when prices happen to be low, with the result that their supply curve is backward bending (Mathur and Ezekiel, 1961). The perverse sales behaviour gets reflected in their consumption and stocking behaviour also (Prakash, 1981; Mathur and Prakash, 1981, Prakash and Goel, 1981). It is established empirically that they consume more at higher prices, and their quantum of consumption is less at lower prices (Prakash, 1981a,b). It is because of this high degree of interrelatedness, that it is imperative to determine consumption, stock and sale simultaneously. In the partial framework, supply or demand function may remain intractable so far as the behavioural propensities of producers are highly interrelated with one another. All these characteristics features of Indian agriculture has got serious implications for agricultural prices in general and foodgrains prices in particular.

#### **1.7(ii) Types of Agricultural Prices in India**

Agricultural prices could be divided broadly into two categories : open and administered prices. Administered prices may be further sub-divided into two categories : (i) Support or procurement prices and (ii) Issue prices. Procurement price is the price at which government purchases the grains from the



producers or traders for the purpose of distribution. Support prices are those prices which are declared by the government to safeguard the producers' interest. These are the prices at which the government will be ready to purchase any quantum of grains in a given market situation. The support prices will mostly be equal to the procurement price, though at times they may differ.

As far as issue prices are concerned, they are the prices at which the government and their agencies release the grains for the purpose of distribution among the consumers. These prices may be arrived at by adding handling and storing cost to procurement prices, minus the subsidy. By adding the commission of fair or ration shop owners to this price, we arrive at controlled prices at which grains are distributed among the consumers. These prices are much lower than the open market prices.

### **1.7(iii) Role of Administered Prices in Indian Economy**

The objectives of the administered prices are threefold : Firstly, they have to safeguard the interests of the consumers in general and the economically weaker consumers in particular. Secondly, these prices have to safeguard the interests of the farmers and make investment in the agricultural sector attractive, and thirdly, they have to ensure price stability in the economy. It is, however, difficult to reconcile the various objectives with each other so that striking a balance between these objectives is a razor's edge problem. Then there is also the problem of ensuring the proper terms of trade between agriculture and non-agricultural products. However, with the first aim in view, the government fixes what are called the issue prices. This is the price at which

the government supplies foodgrains to the consumers through the fair price shops. Most of the consumers belonging to the lower income groups purchase their requirements from the ration/fair price shops, and their demand, to that extent, gets shifted from the open markets to the controlled price markets.

At the open market prices, demand for foodgrains would have been much less, and thus, the subsidised prices prop up the demand artificially. Thus, the price mechanism is not allowed to play its normal role of striking a balance between demand and supply. As a result, a substantial pressure of demand remains active in the market.

To meet this pressure of demand, the government remains under an obligation to purchase an ever-increasing quantum of foodgrains at procurement prices. These prices are fixed in such a manner, as keeps investment in the agricultural sector attractive, and at least, covers the cost of production. However, procurement prices which are based on the cost of production of agriculture are also not fixed forever, but these go on increasing from one year to another. The rise in such prices is sought to be explained partly in terms of the increase in the cost of production of agricultural sector and partly as incentive to growth.

The cost of production of the agricultural sector depends upon the expenses incurred on labour, seeds, irrigation, fertilizers, pesticides, insecticides, tractors, pumps and other agricultural tools and implements. As far as irrigation is concerned, their sources are varied. Canal irrigation has to be paid at pre-determined rates, whereas costs of irrigation through tube wells and other

wells is affected by electricity rates. Rates of canal irrigation and electricity rates are administered prices and these contain an element of subsidy. The other items of cost are seeds, fertilizers (both inorganic and mixed) pesticides and agricultural tools and implements. Most of these inputs are produced by industries called the agro-linked industries. It is the movement of prices of these industries which affect the cost and hence prices of agricultural products in general and foodgrains in particular. We shall thus be interested in studying the price movements of these industries and their determinants. The analysis of these prices may help in understanding one set of determinants of agricultural prices.

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1. Firms producing inorganic fertilizers have U-shaped cost curves. The cost function of this industry shift upwards to the right at a significant rate. Cost are dominated by the increases in the scale of output. Once a particular level of output has been crossed and the subsequent additional output may then be producible at rising parts of the given cost curve, it would warrant the shifting of the function. The inference that can be drawn for this industry is that this industry switches over to a new scale of operation, even before it fully exploits all the economies of given scale. The firms go in for higher installed capacities even before fully exploiting and utilising the existing installed capacity.

2. The firms engaged in the production of mixed fertilizers also have U-shaped cost curves. The industry is subject to the Law of Diminishing Returns. The cost function of this industry has been shifting upwards to the right at a significant rate. Consequently, in a dynamic state of flux, the cost of optimum output to which fix prices are related tend to increase with increasing firm size warranted by the expanding demand and hence increasing size of the market. It is also indicated that cost is dominated by increase in the scale of output. Once a particular level of output has been crossed and the output may then be producible at rising parts of the given cost curve, the cost function shift upwards to the right. The function seems to shift only after the actual operations reach the optimum level of a given size.

3. The industry engaged in the production of tools and implements, operate under conditions of increasing returns to scale or diminishing costs. The firms

seem to satisfy the sufficient condition of cost minimisation. The industry is seen to be dominated by such cost functions which shift vertically to the right. Firms belonging to this industry expand capacities, even before the already installed capacities have been fully exploited. It is possible that though cost curves for this industry is U-shaped, the rising part of the U-shaped cost curve is not operationally relevant, with the result that the operational or observed parts of the shifting curves may really approximate the 'L' shaped shifting curves.

4. Firms belonging to the industry producing pump sets operate at the falling part of the U shaped cost curve, implying that as output increases cost tend to decrease. But, the cost function of this industry shifts vertically to the right. The firms might have been expanding capacities even before the exploitation of the existing installed capacity fully. Thus the cost of this industry seems to have been dominated by the changing scales of output.

5. Tractors and harvestors industry reveals that 'U'-shaped cost curve governs the behaviour of cost of the firms belonging to this industry. The cost function seems to be non shifting stable 'L' type if we go by the graph. But, operation of the firms have been on the falling as well as the rising portion of the cost curve.

6. Industry producing earth-moving machinery reveals that 'U'-shaped cost curve governs the behaviour of costs of the industry. But the industry has got non stable shifting cost and production functions. Whereas inadequate demand may compel the firms either not to exploit the existing scale fully

and under-utilise the existing capacity, with a view to restrict output, preventing decline in the price level, but increasing the cost in the process.

7. Prices of agri-based manufactures behave as fix prices, since absolute prices depend upon the absolute levels of unit costs, whereas the magnitude and direction of changes in unit costs govern the changes in prices.

8. Mark up rates are predicted fairly accurately by the first model which implies that the firms seek to maximise long rather than short-run profits, which, in turn, depend upon the conditions of demand in the market.

9. Prices could also be predicted accurately on the basis of the unit costs derived from the conventional Leontief model at each point separately. If the mark up rates are, however, not reckoned, prices predicted on the basis of unit costs may diverge significantly from their actual values.

10. The temporally shifting optimum unit costs, and hence prices, are predicted quite accurately by the second model which captures the essence of interrelations between the growth of per capita income, shifting optimum unit costs and the temporal movements of prices.