PRICE DETERMINATION AND BEHAVIOUR OF MARK-UP IN INDIAN INDUSTRIES FROM 1959 TO 1985-86

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I hereby affirm that the research for this dissertation titled, ***Price Determination and the Behaviour of the Mark-up in Indian Industries - 1959-1985-1986*** *being submitted to the Jawaharlal Nehru University for the award of the Degree of Master of Philosophy in Applied Economics was carried out entirely by me at the Centre for Development Studies, Trivandrum.*

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Certified that the dissertation is the bonafide work of ***Miss. Sakuntala.G.*** *and has not been considered for the award of any other degree by any other University.*

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CHAPTER I

INTRODUCTION

The determination of prices plays a central role in economic theory. Not only that prices are the signals guiding the allocation of resources in a market economy, they are also the principal instrument in determining the distribution of income among the agents in an economic process.

According to the traditional micro-economic theory, the factors such as cost, demand and market structure play a crucial role in determining the prices at the firm level. The responsiveness of price to changes in cost and demand given the market structure has been a controversial issue in economic literature, as it has wide ranging implications at both micro and macro levels.

On the one hand, traditional micro economic theory postulates that under conditions of perfect competition, variations in demand and/or cost are met by changes in price and/or output. In the macro-economic theories, on the other hand, the thrust is on the behaviour of industrial prices as a medium or an independent source of inflation.

The later theoretical developments in the field, however, pointed to the prevalence of imperfect competition, and thereby argue that prices are more responsive to changes in costs rather than to those in demand.

In the section that follows, we have presented a comprehensive survey relating to the theoretical and empirical aspects of pricing.

SECTION I

1.1 THE THEORETICAL BASE

Traditional theory purported a change in price and output (in the short run) in response to changes in demand and cost. Prices in the competitive markets are determined by the interplay of supply and demand which implies a rapid adjustment of prices to variations in demand. Thus, price in relation to cost would move in the same direction as the changes in demand.

The work of Sraffa, Chamberlin and Joan Robinson in the late 1920's and 1930's threw doubts on the validity of the analysis of price determination based on the assumption of perfect competition. They were concerned with an imperfect market structure, where the firm is a price maker, and maximises profits by equalising marginal cost with marginal revenue (MC = MR). They argued that firms act atomistically and pursue short run profit maximising strategies in each time period. Given the temporal independence of decisions such short run profit implies long run profit maximisation.

A breakthrough was made in the theoretical realm in the late 1930's when the findings of famous Hall and Hitch survey (1939) were published. Until then, the theories of monopolistic or imperfect competition have been generally accepted as typical or

relevant. Hall and Hitch, on the other hand, argued that oligopoly was the main market structure of the business world.

Hall and Hitch questioned the basic premises of the traditional price theories (based on either perfect competition or monopolistic/imperfect competition) and argued that the main preoccupation of the business world is price, and not output as the earlier theories had implied. Based on the empirical evidence from an oligopolistic market structure, they came up with the so called "cost plus pricing model", according to which prices are based on "full" costs, i.e., average direct cost (assumed to be constant over a wide range of output) plus average overhead costs plus a margin for profit.

They pointed out that as there is no certainty about the consumers preferences and the role of competitors, the relevance and application of marginalist principle is difficult to be determined and questionable. Again, both the demand schedules as well as the marginal cost (specifically in a multi-product firm) being unclear to the producer, adherence to the neo-classical equality of MC = MR is eventually impracticable. In fact, entrepreneurs aiming at long term profit maximization do not consider it expedient to adjust their prices in response to short run changes in demand due to high cost of administering frequent price changes. According to what came to be known as `full cost pricing theory', prices would be normally stable and would respond only to the changes in raw material costs and not really to temporary shifts in demand. Such stickiness of prices is explained theoretically, through the `kinked demand curve'. The

price at the kink on the subjective demand curve is the profit maximising one for a wide range of marginal costs. Thus, the cost plus pricing practices seem to have questioned the very base of the Marshallian scissors cross geometry on the simple ground of non-existence of a "given" demand curve.

However, the nature of cost to be accounted in the determination of price posed a controversy between Hall and Hitch and Kalecki. As pointed out earlier, the former argued for full cost pricing (which includes overheads) whereas the latter argued that the actual level of overheads does not directly influence the determination of price since the total overheads remain roughly stable as output varies.[1]

Kalecki argued that there are two-types of short-term price changes, `cost determined' and `demand determined'. The distinction is very much similar to the one between `competitive' and `oligopolistic' prices[2]. Changes in the prices of finished goods are, `cost determined', while changes in the prices of raw materials inclusive of primary food stuffs are `demand determined'. Under oligopoly, any increase in demand for finished products is met by an increase in the volume of production by utilizing the existing capacity. Hence, prices tend to remain stable. However, in the case of raw materials, increase in demand leads to upward shifts in prices due to supply inelasticity and the resultant difficulty for production to catch

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[1] Kalecki, M. (1971), p.44.

[2] Sawyer, Malcolm (1983), p.16.

up with demand. Kalecki argues that the unit cost comprising of wages and raw materials in manufacturing industries are constant over a substantial range of output and then increase sharply once normal productive capacity is utilised. Thus, cost-plus pricing seems to have more relevance in an oligopolistic market structure. Now, let us examine the empirical application of these theories.

SECTION II : REVIEW OF LITERATURE

1.2 INTERNATIONAL CONTEXT

Many empirical works have been done in the realm of industrial pricing both in India and abroad. The studies can be broadly classified into two: (i) those examining the relationship between price on the one hand and cost and/or demand on the other; (ii) those analysing the price-cost margin in relation to factors like concentration, market structure, capital intensity, entry barriers, protection and tariffs etc.

The empirical literature available on the price determination pattern in the industries (whether the price is based on cost or demand/excess demand) and the relationship between price-cost margin/profitability is quite descriptive and voluminous. Since it is practically impossible to review all the studies, we are concentrating on a few representative ones. The precise method of price determining pattern varies with firms and industries as there exists wide diversity among them in terms of products, market share, government policy etc. In this section

we briefly review the econometric methods which have hither to been used in explaining the role of cost and demand factors in price determination.

In this context, economists like Kalecki[3] and Gardiner Means[4] have written about the concept of 'normal' or sticky prices in the short run. The first exponent of normal price hypothesis was Godley[5] who expressed this as a proportion of normal or standard unit costs. Godley while exploring the short run behaviour of prices in the U.K., between 1950 and 1967 introduced the important concept of normal cost pricing. He found a striking pattern about the deviations between changes in unit costs and changes in prices namely, the change in price is greater than the change in cost when output rises rapidly and less than the change in cost when output stagnates (He assumed existence of excess capacity). This led him to hypothesize that firms fix their prices not according to actual unit costs but the unit cost estimated on the basis of the normal or trend increased in output. Consequently, short term fluctuations in demand and output will have no significant effect on prices. His hypothesis was that demand on the mark up over normal unit costs was insignificant and negiligible and prices tend to move closely with normal unit cost only. He assumed that firms have excess capacity and as such they are in a position to vary their utilization rates and also assumed that the firms add a mark up to the average costs when operating at a standard or normal rate of capacity utilization.

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[3] Kalecki, M. (1939).

[4] Means, G.C. (1935).

[5] Godley, W.A.H. (1959).

Later on, a series of empirical studies incorporated normal unit labour costs into price equation; (for eg.,) price equations for the US by Schultze and Tryon (1965), Fromm and Taubman (1968), and Eckstein and Fromm (1968). Some of these studies found that capacity utilization rate indicating excess demand had an independent influence on price.

A number of studies have tried to correlate price movements with different variables representing the impact of demand changes. Brownlie[6] regressed profit margins on the ratio of output to horse power of installed machinery as a demand variable and obtained equations which for both cross-sectional and time-series data indicated a significant demand effect. His findings showed that firms adjust prices as well as output and stocks to changes in short-run demand conditions. He further observed a considerable variation in profit margins over the cycle and also a relatively strong relationship between demand pressure and profit margins.

The major investigation of pricing in the US by Eckstein and Fromm[7] allowed for both cost and demand influences in the short and long terms. He found that cost and demand elements explained changes in the prices in the U.S. They concluded that the price variations explained roughly 50 per cent would be attributed to cost changes and 50 per cent demand.

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6 Brownlie, A. (1965).

7 O.Eckstein and G. Fromm, (1968).

Rushy and Lund[8] presented price equations by using an index of excess demand for labour, as a proxy for demand. Their model is based on the traditional view that price changes are dependent solely upon excess demand. They found demand variables to be significant in many cases and inclusion of them increasing the value of $\bar{R}^2$.

A turning point in the study came from McCallum[9] who stated that price changes are brought about by excess demand alone. He used an index of excess demand for labour (Dow and Dicks Mireaux index) and a lagged value of the dependent variable (i.e.,price).

Gordon's[10] study for the U.S. economy also demonstrates the strong effect of demand on prices. Using deflators instead of prices, he tried to find out the residual effect of raw material prices. His results confirmed the established norm that the demand effect appears to be present in certain periods and that this effect is high on durable goods.

However, the findings of Neild who first tested the demand hypothesis were quite contrary to what was observed by the above studies. Using the U.K. manufacturing data for the period 1950-61, Neild[11] found that the introduction of a demand variable added virtually nothing to the explanatory power of the best price equation based on input costs, productivity and lagged

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8 Rushdy, F. and Lund, P.J. (1967).

9 McCallum, B.T. (1970).

10 Gordon, R.J. (1975).

11 Neild, R.R. (1963).

prices. His conclusion was that price-cost relationship is considerably stable in the short run, whereas the pressure of demand has no significant impact.

The empirical works by Dow (1956), Klein and Ball (1959), Dicks Mireaux (1961), Neild (1963) and Godley and Rowe (1964) also supported the view that price changes were determined by changes in labour costs and some measure of import prices.

The implications of the findings of Godley and Nordhaus[12] regarding the impact of demand on prices were similar to those of Neild. In their study they found that the effect of demand on prices was very small once normal unit costs were measured appropriately. This again is in conformity with Godley's original hypothesis that price responds to changes in normal cost and independent of excess demand.

Bain and Evans[13] noted that the results of Neild and of Godley and Nordhaus were directly contradicted by numerous company statements to the effect that low demand greatly reduced prices. They suggested that Godley and Nordhaus' correlation between actual and predicted prices (average cost based) relevancy and found that the turning points of the simulated series lagged behind the actual series. Their argument was that costs will respond with a lag to a downturn in demand while prices would respond directly. In addition, U.K. data is subject

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[12] Godley, W.A.H. and Nordhaus, W.D. (1972).

[13] Bain, A.D. and Evans, J.D. (1973).

to a limitation as found by Stigler and Kindahl[14] namely, actual transaction prices differ from quoted prices, the latter usually lagging in downswing. Quoted prices might, therefore, move very closely with costs even though actual prices had already responded to demand changes.

Coutts, Godley and Nordhaus[15] hereafter (CGN),in a much larger study confirmed and extended the normal cost hypothesis to a number of sectors within manufacturing industry. Their analysis is based on the assumption that firms calculate the level of cost with reference not to the actual level of output which fluctuates both seasonally and cyclically, but to a normal or trend value. While they have normalized labour cost components such as hours, earnings and productivity, non-labour costs were not normalized since no general criterion exists for doing this. For non-labour cost the real problem concerns the lag structure. To calculate the lag structure between the cost and price changes to be applied to normal cost, CGN consider the alternative policies like historical cost pricing, replacement cost pricing and average cost pricing. A noteworthy point here is that CGN model has taken current costs or direct costs in a broad sense. Direct costs changes are frequent and affect all firms though to different degrees. Overhead costs are much more differentiated, due to large inter-firm differences in administrative, technical, and clerical staff, capital intensity as well as the age of machines.

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[14] Stigler, G.J. and Kindahl, J. (1970).

[15] Coutts, K.J. Godley, W.A.H. and Nordhaus, W.D. (1978).

In order to find the significance of the demand factor in the determination of prices, CGN used the time series of normal cost along with ten alternative measures of demand in ten alternatively specified price equations. They did a large number of tests - even larger than in the 1972 study - by using both levels and first differences in prices and demand with and without lags. The results are overwhelmingly against the demand hypothesis. In the majority of cases, the value of the coefficient for the index of demand pressure is small and insignificant.

The findings of their study also showed that the behaviour of the mark-up was partly and temporarily affected by corporate taxes, price controls and foreign competition doesnot have any impact on the mark-up.

Moreover, the other issues were concerned with the discussion on asymmetric role in behaviour of prices i.e., prices rise when costs rise but do not fall when costs fall and price rise when demand increases, but do not fall when demand falls. But the empirical findings has no strong econometric evidence. Yordon[16] has observed the relationship between the increase in prices and increase in cost of raw materials.

Donald G.McFetridge[17] found that almost 50 % of the price variation in the Canadian cotton textile industry was explained by demand. The demand variables included were the deviation

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16 Yordon, W.J. (1961).

17 McFetridge, Donald G. (1973).

between the actual and desired ratio of unfilled orders to sales and the deviation between the actual and desired ratio of finished inventory to sales.

Laidler and Parkin[18] cite Solow as a supporter of the demand hypothesis and as a critic of the normal price hypothesis. But in Solow's analysis, demand effects appear to be quite weak and his findings seems to confirm the view frequently expressed by Robert Neild and others, that the British price level is insensitive to demand pressures and primarily cost determined.

Shinkai[19] came with similar results for Japanese industry. He, like Lund and Rushdy for Britain and Eckstein and Fromm for the U.S. found that cost explain roughly half of price variation. On the other hand, although dummy variables for demand were very significant, they explained only between 10 per cent and 14 per cent price variation on their own, adding virtually nothing to the equations containing cost variables.

Jaime Ros[20] in his study analysed the price determinants in the Mexican manufacturing sector, which included the relative influence of domestic costs, foreign prices and short-run demand on prices. The results obtained suggest that domestic normal costs determine to a large extent the course of Mexican manufacturing prices and short run changes in demand have no significant impact on the domestic prices. His study also found

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18 Sylos-Labini, P. (1979 a).

19 Shinkai, Y. (1974).

20 Ros, Jaime. (1980).

that foreign prices also have some influence. However, the results gave support to a normal cost pricing model, elaborated by Coutts, Godley, and Nordhaus.

In his study Ros Jaime[21] has found that the domestic firms may not behave as absolute price leaders with respect to foreign firms they show a large degree of local power and autonomy in their pricing decisions. The results appear to be consistent with some of the main features of Mexico's manufacturing sector where a higher degree of industrial concentration and a dominant orientation towards the domestic market prevail and whose imports are mainly complementary to domestic production.

So far, we have been discussing those studies dealing with the role of cost and/or demand factors in the determination of prices. The following discussion centres on the studies dealing with price-cost margin along with its determinants both in the international and national contexts.

Some of the studies reviewed are industry - based while some others are company-based. For purpose of convenience we divide them into two categories, one, using price-cost margin (either P/AC or P/MC) directly as the dependent variable and the other, taking price-cost margin in the form of profit rate (either P-AC/AC or any other variant of this) as the dependent variable for regression analysis.

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[21] Ibid p.223.

Studies belonging to the first category began with the work of Schwartzman[22] whose main concern was to analyse the effect of market concentration on average price-cost margins in the 61 American and Canadian four-digit manufacturing industries. He found significant but low valued positive relationship between price-cost margin and four-firm concentration ratios of the industries.

Collins and Preston[23] observed that four-firm concentration appeared to be significantly associated with intra-industry differences in price-cost margin whether or not differences in capital output ratios and other variables were taken into account. He found that the association between the two aforesaid variables are substantially stronger in consumer goods industries and not stronger in producer goods. Their results not only showed the significant effect of concentration on the margin of four largest firms in consumer goods industry, but also the margins which were higher than that of other firms.

Shepherd[24] found price-cost margins to be consistently associated with concentration and advertising intensity for all the U.S. four-digit manufacturing industries. He had not included entry barriers.

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22 Schwartzman, D. (1959).

23 Collins, N. and Preston, L.E. (1969).

24 Shepherd, N.G. (1972).

Khalilzadeh - Shirazi's[25] study which was consistent with established wisdom, a positive relationship between price-cost margin and structural variables. They, excluded all industries with low product specialisation and poor concentration data. Some of the industries were too heterogeneous to be appropriate for economic analysis, while for others the estimates for explanatory variables were necessarily imperfect.

McFetridge's[26] study on market structure and price cost margins in analysing of the Canadian manufacturing sector finds that given the rate of growth of demand and the level of capital intensity, inter-industry differences in price-cost margins are significantly related to a variety of measures of industry concentration. Equations which are non-linear in the concentration variable explain a slightly higher proportion of the variance in gross margins than those which are linear. This particular non-linearity is consistent with the hypothesis that the relative effect of market concentration increases with the level of concentration. His second findings was that a given level of market concentration exerts a significantly greater effect on price-cost margins in the consumer goods sector than the producers goods sector.

In Holterman's[27] study for the U.K., included all three-digit industries, and his findings showed that the insignificance of the structural variables which was used, as there existed

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25 Khalilzadeh - Shirazi. (1974).

26 McFetridge, Donald G. (1973): Op.cit.

27 Holterman, S.E. (1973).

differences in the specification of variables. The major difference is due to the sample size which he has included in the three digit industrial classification. His study also excluded an allowance for foreign trade.

Cowling and Waterson[28] study indicated that concentration might have an independent effect on profitability. Their data covered changes in structure and performance over the period 1958-68 and indicated a significant positive association between changes in concentration (measured with the help of Herfindahl index) and changes in price-cost margin.

Qualls[29] in his study for 79 four-digit manufacturing industries over the period 1958-70 hypothesised that the relationship between industrial concentration and cyclical flexibility of prices (or price-cost margins) may be positive rather than negative as conventionally held. This study dealt with these problems by investigating the trend-adjusted cyclical variability of price-cost margins. His empirical results showed a significant and positive relationship between industrial concentration and cyclical flexibility of margin. And as a pure statistical matter, the traditional hypothesis of a negative relationship between price-cost margin flexibility and concentration appeared to be rejected more strongly by empirical results than an alternative hypothesis of no relationship between margin flexibility and concentration.

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[28] Cowling, K. and Waterson, M. (1976).

[29] Qualls, P.D. (1979).

Bain[30] in his pioneering work found that profit and concentration have a negative relationship for 42 U.S. manufacturing industries. He extended his work in which he considered effect of entry barriers(which is an additional dimension of market structure) in addition to concentration, found that for 1936-40 and for 1947-51 profit rates are higher in high concentration industries than with low concentration and also found that profit rates were substantially higher in very high entry barrier industries although the results show not much about the effect of substantial and moderate or low entry barrier industries.with high entry barriers amass high profit rates.

Stigler[31] pointed out that four-firm concentration ratio was positively associated with profitability in certain years but absent in some others for all U.S. manufacturing industries for 1947-54.

Mann[32] study also confirmed the same results for 30 U.S. manufacturing industries for 1950-60. Bain and Mann reported that in terms of profitability, high barriers industry differed from all other industries but no differences existed between substantial or low barriers industries. Thus both the studies point to entry barriers and concentration as two major determinants of profitability in U.S manufacturing industry over a considerable period of time.

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30 Bain, J.S. (1951).

31 Stigler, G.J. (1963).

32 Mann, H.M. (1966).

Hall and Weiss[33] who studied the data for 341 large U.S. industrial corporations over the period 1956-62 found that size was more closely associated with rate of return than concentration.

Camanor and Wilson's[34] study based on information from 35 U.S. consumer goods industries for the period 1954-57 studied the relationship between profitability, advertising, market structure and performance. They split up the composite barrier variable and estimated a continous relationship between the rate of return on capital and the various components of market structure. Their results showed a strong influence of advertising intensity on profitability and questioned the effect of concentration.

1.3 THE INDIAN CONTEXT

As relating to the Indian industries, lack of substantial work on price cost margin is quite evident. However,we would briefly review the important studies here.

In his study of 29 manufacturing industries in India Gupta[35] found no significant correlation between the height of the entry barriers and the rate of profit in the four big units, as he observed the same between the former and the actual concentration ratio. It is on this ground that one remains indeterminate either

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[33] Hall, M. and Weiss,L.W. (1967).

[34] Camanor, W.S. and Wilson, T.A. (1967).

[35] Gupta, V.K. (1968).

to favour or reject the hypothesis of a prominent association between the rate of profit and entry barriers. He also found the long run cost functions L-shaped for the same industries.

Rise in wage cost had nothing to do with with rising prices was Hajra's[36] contention after studying as set of industries over the period 1953-66. Rather, he observed that the rise in material costs was one of the most important factors determining the same in product prices. He added that even productivity increase hardly influenced rise in wages.

In another study on price cost margin in Indian industries Sawhney and Sawhney[37] found that the rate of profit was designed to a significant extent by the degree of capacity utilisation. The non-linear formulation provided a much better results than the linear one. The capital - output ratio was statistically insignificant with reference to price -cost margin.

Considering four regions in the country for the textile industry in 1972 Barthwal's[38] pointed out two factors affecting profitability - past profits and cost leverage. Capital intensity, size, growth etc., were not found statistically significant to determine profitability.

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[36] Hajra, S. (1965).

[37] Sawhney, P.K & Sawhney, B.L. (1973).

[38] Barthwal, R.R. (1977).

Adopting multiple regression techniques Katrak[39] concluded that industries having less import competition with import orientation and high protection were enjoying higher profit margins than others. Industrial concentration being described as an inverted U -shaped curve. This more or less agreed with the findings of Sawhney and Sawhney.

Lahiri, Madhur, Purkayastha and Roy[40] studied the factors affecting output, prices, wages and raw material costs in the factory sector of Indian industry. The focus of the study is on the price-quantity adjustment mechanism in Indian industry with specific attention to the role of government policies and international trade in the determination of output and prices. Their model is constructed in a disaggregated four sector framework classified as use based, consumer goods, capital goods basic and intermediate goods. Their examination of the price-quantity adjustment mechanism in Indian industry shows that although variations in demand lead to variations in output in the short run, they also leads to variations in industrial prices in the long run.

In Pani's[41] model, industrial prices are not directly affected by demand. These prices are rather affected by industrial output via wage and unit cost specifications.

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[39] Katrak, H. (1980).

[40] Lahiri, A.K. Madhur, S. Purkayastha, D. and Roy, P. (1984).

[41] Pani, P.K. (1977).

SECTION III

1.4 STUDY PERSPECTIVE

More recently a number of studies regarding the behaviour of industrial prices have been undertaken for less developed and newly industrialized countries. The findings of the studies undertaken in the international context stressing the dominant role of cost in determining the industrial prices in mostly industralised economies seem to apply in the Indian context too.

Very few studies have been undertaken on price-cost margin in the Indian context, in spite of the existence of large business houses and an oligopolistic market structure. These studies have compared the relative movements of prices and costs over time in a particular industry. The most noteworthy among them is Chatterji[42]. The main aim of this study is to find out the behaviour of industrial prices in the Indian context, by looking into the relationship between price, cost, demand and market structure in input-based industries.

Notwithstanding the above general survey of literature in the relevant field, we, however, would like to review Chatterji's work in greater details. Inevitably, it would be useful, for the fact that our study is both directly based upon and an extension of her work. Also, her work is the only of its kind done in the Indian context, at present.

The study attempts to find the relation between price and cost in Indian industry and to determine whether demand proxied

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[42] Chatterji, R. (1989).

for activity has any direct or independent effect on price cost margin, using the Coutts, Godley and Nordhaus model (1978)[43] both at the aggregate and disaggregate levels. The findings of this study show that the growth of the more modern, more highly concentrated industries has led to the development of oligopolistic environment in Indian industrial sector which also provides the strong basis for cost-plus pricing practice. Structural change has also meant the declining importance of the more traditional industries. The demand for the output of the new industries tends to fluctuate with the overall demand much more than that of old industries. This also means that there is a positive correlation between aggregate activity levels and share of industries with relatively higher mark-ups.

The major conclusion of this study is that prices are based on mark-up over costs and that demand factors have no significant role to play. The findings of this study are similar to those of the industrial sector in a more developed economy.

However, the following observations may be made with regard to her work.

1. As the study period ends in 1973, the impact of major policy changes viz., the liberalization policy in the Indian industrial scene after 1975 remained absent in her work. In fact, her thesis deals with a quasi-closed economy:

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[43] Coutts, K.J. Godley, W.A.H. and Nordhaus, W.D. (1978): Op.cit.

2. Her work, by and large, being an aggregate level analysis, the determination of prices at the disaggregated level of industries needs to be explored.

3. Her period of study (1947 -77) was also characterised by lack of demand particularly for certain consumer goods which might have led to cost determined prices. Her study period is extended mainly to look into the effect of demand which seems to have picked up in the latter period.

1.5 SCOPE AND OBJECTIVES OF THE PROPOSED STUDY

It is in the light of the above observations that we present the main objectives of the proposed study as follows:

1. To examine the behaviour of industrial prices in the Indian context by looking into the relationship between price on the one hand, cost, demand and market structure on the other.

2. In pursuance of the above objectives to ascertain whether Chatterji's findings concerning input-based/ use based industries are valid at a further disaggregated level like fertilisers and pesticides, drugs and pharmaceuticals (chemicals), cotton spinning, jute textiles, (textiles), heavy electricals,heavy vehicles (general engineering), bicycles and motor-cycles and tobacco .

3. To analyse the inter-temporal behaviour of the mark-up in the selected industries and to make a preliminary enquiry into the effects of liberalisation measures on the mark-up in the two sub-periods (i.e., 1959-73 and 1974-1985/86) by using trend analysis.

1.6 SCHEME OF THE STUDY

This study is organized in the following sequence:

Chapter II involves the discussion on sources of data used in the study (viz CSO, ASI, IIP and Input Output Table 1973-74) and the methods followed in calculating the major variables like transaction price, labour cost, raw material cost, prime cost and activity or potential utilization ratio.

The third chapter deals with the factors affecting price determination, viz demand and cost and their respective roles. This has been carried out by using four sets of equations specified in terms of both level and change for the two sub periods.

The fourth chapter looks into the inter-temporal behaviour of mark-up and the effect of liberalisation on the behaviour of mark-up.

The end chapter discusses the broad findings and gives some suggestions for further research in this area.

CHAPTER II

METHODOLOGY AND DATA BASE

This chapter is mainly concerned with the methodology followed and data base used in the present study. We have divided this chapter into two main sections. The details regarding the selection of our study period as well as of the industries are presented in Section I. A note on the data base used has also been added in the above section. The techniques involved in computing the variables are discussed in Section II.

SECTION I

1.1 THE PERIOD OF STUDY

As has been pointed out in the introductory chapter, the present study is essentially an extension of Chatterji (1989). The reference period chosen for this study is from 1959 to 1985/1986 (whereas 1947 to 1977 was the period of study for Chatterji). The entire period has been divided into two sub periods; sub period I covering 1959 to 1973 and the sub period II, 1974 to 1986. The former period is characterized by policy induced barriers in the form of investment licensing, controls, etc., while the latter is characterized by export-led industrial growth (which eventually led to broad-banding, relaxation of MRTP limits, etc). The process of liberalisation started in the beginning of the latter period (1974 -1985/86) has led to remarkable changes in the industrial sector.

Moreover, it is also presumed that during the period 1959-1973, especially during 1965-73, there was slackening of demand as against an increase of demand for the period 1974 to 1986. Over the last three decades or so of planning in operation, the Indian industries have undergone important structural changes which have eventually led to a shift in demand pattern favouring high income groups particularly for consumer durables and non durable goods.

These industries, after a spell of slow growth during 1961-1973 registered significant grwoth thereafter. This, apart from catering to the demands of the richer class, prompted inflationary price rises in the economy. Real wages being sapped due to above series of strides by workers over a certain phase brought down the level of production. However,the capitalist class had gained enough from the inflation and greatly enhanced their demand for consumer durables as well as non-durables which was detrimental to the growth of the industrial sector. In this line, Raj (1976) observed that, "if this continues a pattern of industrial development based on high rates of growth of demand for luxury and semi finished products may well come to be regarded as the only way of maintaining a high rate of growth of output in this sector".[1]

1.2 DATA BASE

It may be noted that Chatterji has used the following two sources of data: (i) Census of Manufacturing Industries (CMI) for

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[1]. Raj, K.N. (1976). p.226.

the period 1947-58 and (ii) Annual Survey of Industries (ASI) for the period 1959-77. We have excluded her study period for two reasons which are given below.

(i) As a result of this collation of data, her findings might have been affected by the heterogeneity of the data sources as it restricts comparability. It is for this reason that we have excluded the period 1947-58 from our analysis and have used a single source, namely, the Annual Survey of Industries (ASI) published by the Central Statistical Organisation (CSO).

(ii) As the data bases are different, it is also not amenable to appropriate comparison, particularly at the disaggregated level on which the present study is based.

The ASI schedule is fairly detailed and provides information on number of factories, capital invested, persons employed, salaries, wages and benefits paid to employees, fuels, materials etc. consumed, total value of output, value added and depreciation. The factory sector is divided into two groups for the purposes of the survey. Group I called the Census Sector consists of all factories employing 50 or more workers with the aid of power or 100 or more workers without the aid of power. Group II called the Sample Sector covers the remaining registered factories those employing 10 to 49 workers with the aid of power or 20 to 99 workers with the aid of power.

However, for the period after 1982-83 no census/sample break-up is available. This may pose some consistency problem in

the compilation of the data series. Moreover, combining sample and census sectors is rather complicated because the classification systems followed before and after 1973 are different. Since 1973 the central statistical organisation (CSO) has been following a different classification system called the National Industrial Classification (NIC). Consequent, upon which the individual industrial groupings have undergone some changes. To maintain the consistency for this adjustments has been made in this study by comparing NIC with relevant ASI classification system. Therefore, for purposes of consistency and comparison, the present study uses ASI census sector data upto 1982-83 and thereafter, the data on factory sector.

For the purpose of this study, the main series of data used are the employment series consisting of workers and other than workers, the emoluments series consisting of wages (workers) salaries for workers (other than workers) and total input and output series. These data have been used for computing variables like transaction price, actual prime cost, actual labour cost and raw material cost.

As regards the type of price series used Chatterji has established in her study that there is a strong element of cycle in the time series on price of output and inputs. She has used both actual and normal series output/input prices. The actual series means time series with `cycle', whereas the normal series refers to time series `without cycle'[2].

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[2] For details regarding the theory of time series, see, Box, G.E.P. and Jenkins, G.M. (1976).

However, between list price and transaction price we have chosen the latter, as the former normally tends to hide price response to changes in demand. This may be more relevant as we have used the actual series and not the normal one. The industries chosen for this study and procedure for computing these variables are given below.

1.3 SELECTION OF INDUSTRIES

The selection of industries in our study follows two criteria. The first criterion has been to include all industries taken by Chatterji in her study. However it may noted that five out of six industries taken by her are at a highly aggregated level. The second criterion is to include industries at a further disaggregated level. Keeping the above in view we have drawn additional eight industries at three digit level from use based classification. Hence the present study analysss the fourteen industries in total. The industries studied here are:

Table 2.1 : Sample Industries

Criterion I	Criterion II
Sugar	Fertilisers and Pesticides
Textiles	Cotton Spinning
Paper	Jute Textiles
Iron & Steel	Heavy Electricals
Chemicals	Heavy Vehicles
General Engineering	Bicycles and Motorcycles
	Tobacco
	Drugs and Pharmaceuticals

The industries according to criterion one, covers about 70 per cent of total industrial output[3]. The three digit level industries under criterion two accounts for about 30 per cent of total industrial output[4].

SECTION II

DATA COMPUTATIONS

2.1 TRANSACTION PRICE

The transactions price index is a derived price index constructed by dividing the ASI output value index ($\Sigma p_n q_n / \Sigma p_0 q_0$) by the index of industrial production which is a Laspeyres base weighted volume index ($\Sigma q_n p_0 / \Sigma q_0 p_0$). Thus the transactions price is a Paasche, current weighted, price index ($\Sigma p_n q_n / \Sigma p_0 q_n$).

2.2 COMPUTATION OF COSTS

(a) RAW MATERIAL COST

As the ASI Census data relates to total material input, the raw material price index derived by deflating the ASI value of raw material input by the index of industrial production includes manufactured inputs also. However, inclusion of own ndustry input in raw material cost would clearly bias the data in favour of a strong price-cost relationship. As a result, an alternative method of raw material price was calculated using weights drawn from input/output matrix for the year 1973/74 and

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[3] Chatterji, R. (1989) Op.cit., pp.48-49.

[4] See, for details Report on Currency and Finance, 1986-87, Vol.2.

the official wholesale price indices for raw materials net of all intra-industry input transactions. Thus, raw material cost index was calculated by taking the relative weights of manufactured and non-manufactured inputs but excluding own industry input to each industry. [See, Chatterji, (1989)]. This has been used throughout in the price-cost relation exercise. The weights were used with the relevant input price indices to give a composite raw material price index. A total of twenty six different input price indices have been used across industries, the list of which along with the weighting diagram is presented in Table 2.2.

Whereas Chatterji has included only the major weights of the raw material inputs, we have taken into account both the major and minor weights.

TABLE 2.2: MAJOR AND MINOR INPUTS USED IN THE SELECTD SAMPLE INDUSTRIES

INPUTS\INDUSTRY	SUGAR (1)	PAPER (2)	TEXTILES (3)	CHEMICALS (4)	IR&ST (5)	GEN.ENGG (6)	TOBACCO (7)	DRUGS&PHARMA (8)	COTTON SPNG (9)	JUTE TEX (10)	HEAVY VEH (11)	HEAVY ELS. (12)	BC & MC (13)	FER&PEST (14)
Tobacco							78.06							
Raw cotton			67.56						86.15					
Raw jute			10.48							89.83				
Raw wool			0.91											
Logs	0.77	22.28									1.91		1.92	3.57
Coal		6.27			3.87				0.73					1.85
Petrol				11.29										
Other minerals				13.21	15.23									
Iron ore					6.78									
NFA	0.92	9.68		12.88			11.81	10.83						
Electricity		12.96	4.67	20.83	16.35	3.47		2.16	4.36	4.77	3.00	1.96	2.97	15.88
Sugar cane	97.04					5.52								
Chemicals	0.52	29.59	13.11		2.47		1.53	67.20	6.88	0.87	2.73	1.74	6.68	33.74
Non-metallic	0.18	4.74			5.33			2.07				2.56		3.20
NEM	0.72	4.90	3.28	5.07	1.57		1.54	1.11	0.14	2.72	4.20	1.99	4.17	4.73
EM											1.21	23.42		
TQ					11.57									
Metals				10.24	6.61	27.54		2.44		0.97	27.73	25.87	27.48	5.19
Food Mfg.				11.23										
Paper				7.92			7.06	4.94	0.85					
Non-Ferous				7.32	31.80	10.08		2.66			39.92	14.21	2.43	4.12
Iron&Steel						53.39			0.25		2.46	22.11	39.56	
Textiles		5.68		12.46				4.38		0.84		2.39		14.41
Wood Prds									0.39		6.52	2.84	6.46	2.06
Rub & Plastics								1.12			8.41	1.91	8.34	1.73
Petrol	0.55	3.90						1.09			1.89			9.52

Note: (i) NFA denotes Non Food Articles; NEM denotes Non Electrical Machinery; EM denotes Electrical Machinery; TQ denotes Transport Equipment; BC & MC denotes Bicycles and Motorcycles; IR&ST denotes Iron and Steel.

(ii) Inputs into each industry include non-manufactured (columns 1 to 12) and manufactured (column 13 to 26) inputs but exclude own industry input into each industry.

Source: Input output data 1973-4, National Accounts Statistics, January 81.

(b) LABOUR COST: For both aggregate industry and individual industry data actual labour cost has been defined as:

$$AULC = \frac{W_1 \times Wage \times Lop + W_2 \times salary \times LATC}{X}$$

Where AULC = Actual unit labour cost

Wage = Operative's wage

Salary = Salary for administrative, technical and clerical (ATC)

(W_1) = Share of wages total emolument bill in 1973/74.

(W2) = Share of salaries in total emolument bill in 1973/74.

LOP = Actual value of operative employment

LATC = Actual value of ATC employment

X = Actual output.

The proportions of wages and salaries in total emoluments across industry are presented in Table 2.3.

Table 2.3: Relative Proportions of Wages and Salaries in Total Emoluments

Industry	Wages(W1)	Salaries(W2)
Sugar	0.580	0.419
Textiles	0.814	0.185
Paper	0.591	0.409
Iron & Steel	0.580	0.419
Chemicals	0.503	0.497
General Engineering	0.523	0.477
Fertilisers and Pesticides	0.499	0.500
Cotton spinning	0.809	0.190
Jute textiles	0.580	0.419
Heavy electricals	0.416	0.583
Heavy vehicles	0.557	0.442
BC & MC	0.654	0.346
Tobacco	0.662	0.337
Drugs and Pharmaceuticals	0.490	0.509

(c) PRIME COST

Given the indices of labour cost (actual) and raw material cost separately, the two were then combined to give an index of total prime cost (actual). The relative proportions of raw materials and labour in total prime or variable cost were calculted in the following way.

The ratio of total input was obtained from the total output from the input-output data 1973/74 by excluding its own industry input and from this the weights were derived for the respective industries. For each industry, the proportion of total input (excluding its own industry input) to total output is calculated from the input/output table for the year 1973-74.

This ratio is, then, applied to the value of the output, to obtain the value of raw material input for the period of the study.The ratios of the sum of raw materials cost and labour cost to total prime cost have been used to arrive at the relative weights for constructing prime cost series.

The prime cost is the weighted average of total emoluments and raw material cost.

The weights used for the computation are given in table 2.4.

Table 2.4: Relative Weights of Raw Material and Labour in Prime Cost (1973/74)

Industry	Raw Material	Labour
Sugar	0.89	0.11
Textiles	0.40	0.60
Paper	0.57	0.43
Iron & Steel	0.53	0.47
Chemicals	0.83	0.17
General Engineering	0.61	0.39
Fertilisers and Pesticides	0.71	0.29
Cotton spinning	0.68	0.32
Jute textiles	0.62	0.38
Heavy electricals	0.73	0.27
Heavy vehicles	0.69	0.31
BC & MC	0.75	0.25
Tobacco	0.80	0.20
Drugs and Pharmaceuticals	0.81	0.19

2.3 COMPUTATION OF ACTIVITY

THE POTENTIAL UTILIZATION RATIO

The potential utilization ratio (PUR) is defined as a ratio of actual output to the potential production of industry in a given year. Potential production refers to the peak output realized during or prior to the year under consideration. Thus, the industrywise PUR has been constructed. This has been used as the demand proxy in this study which was also same in Chatterji's model.

However, the existing literature does not convince us to use PUR as demand proxy due to the fact that supply factors can influence the PUR as well[5] (Chatterji also emphasize this point by calling it an `activity'). Hence,we use the `PUR' in a rather loose sense as activity which assume to take into account the effects of both supply and demand factors.

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[5] Ibid.

The major and direct source of data on price was the official series on wholesale price statistics of India. To compute transaction prices the index of industrial production published by the CSO is used. This is an index of the volume of industrial output measured in terms of physical quantities. To maintain consistency with the ASI data, the IIP and wholesale price indices are also presented in the form of calendar year from 1959 to 1971. For the year 1972 transaction price could not be derived as there were no census data for that year.

Then from 1973-74 onwa rds, the IIP and wholesale price index were also presented in the financial year to maintain consistency with the ASI data which is in the form of financial year. To obtain a continous series of the index of industrial production for the period 1959-85/86 series with different base years 1951, 1961 were spliced together and one final index with 1970 as base is obtained. To maintain consistency with Chatterji's study raw material cost has been calculated from the input-output table for the year 1973-74 and which was also available at the time of study.

2.4 DATA SERIES

The data series used in the equations for testing the relationship between price, cost, and activity or potential utilization ratio are presented in Appendix I for each of the industries that are studied here - sugar, paper, textiles, iron and steel, chemicals, general engineering, tobacco, drugs and pharmaceuticals, cotton spinning, jute textiles, heavy

electricals, heavy vehicles, bicycles and motorcycles and fertilisers and pesticides. Data are presented for the five variables - transaction price, actual labour cost, raw material cost actual prime cost, and activity or potential utilization ratio.

CHAPTER III

PRICE DETERMINATION: THEORY AND EMPIRICAL EVIDENCE (1959-1985/86)

This chapter examines the determination of price in terms of both level and change in the Indian manufacturing sector. More specifically, it focuses on the role of cost and demand factors in influencing industrial price formation in theory and practice.

As stated earlier, our study is basically an extension of Chatterji's (1989) work upto the recent period. Chatterji has concluded on the basis of a sample of six industries that industrial pricing is primarily cost determined during the period 1947-77. It may be noted that she has combined two sources of data for her study: (1) Census of Manufacturing Industries (CMI) for the period of 1947-58 and (2) Annual Survey of Industries (ASI) for the period, 1959-77. Her findings, therefore, may be conditioned by the heterogeneity of the data. Because of the comparability problem, we have used a uniform source of data, i.e., ASI. Hence, the period of study is restricted to 1959-85/86.

Ideally the validity of the model should be tested only for the period when demand is very high. It may, however, be noted that a part of her study period, roughly 1965-73, witnessed stagnation in the industrial sector in India, to a great extent due to falling/inadequate demand in the economy. If we exclude this period the statistical estimation become problematic due to small size of the sample. In order to rule out the possibility that her results are due to the small sample size (in terms of

number of industries), we have included a few more industries which have experienced a buoyant demand during the recent years. Moreover, the growth of demand for industrial products was comparatively higher for the period 1978-1985/86 (included by us) than that of the period 1947-58, (excluded by us). Consequent upon this one would expect the influence of demand on price during the period of the present study has a better chance of influencing the price formation.

This chapter has been divided into two sections. Section I reviews the relevant theoretical literature and discusses the empirical work so far carried out in the Indian context. Section II presents the empirical results and summarises the results.

SECTION I

3.1 THEORETICAL ISSUES

Theories of price determination are closely linked to the theories of firms. The classical theory of price was concerned with perfect competition and monopoly markets which was taken for granted upto the early 1920's and it became invalidated as the significance of several business strategies to enhance revenue through sales promotion activities like advertising came to be recognised.

However, the fundamental criticism against the pure competition theory was regarding the assumption that firm expand their output with falling costs without however growing infinitely large. The wide spread dissatisfaction with this

assumptions led to the publication of a number of articles which culminated in the Great cost controversy of 1920's. The main participants in this controversy are Sraffa, Chamberlin and Joan Robinson. Sraffa's main contention was the incompatibility of falling costs with competitive equilibirum. At the same context, Joan Robinson was concerned with analysis of firms behaviour under negatively sloped demand curve. This was later developed by Chamberlin[1] and Joan Robinson[2] although their analytical approach and methodology differed considerably. Former was concerned with monopolistic competition which was characterised by product differentiation whereas the latter was concerned with imperfect competition and large group case.

Following these developments in the theory of the firm, (Chamberlin, 1933, Robinson, 1933) interest arose during the 1930's as to whether the pricing practices adopted by businessmen provided supporting evidences for these theories. Hall and Hitch in their famous article of 1939, questioned 38 firms to understand the price setting behaviour and adjustment of the prices. Businessmen typically set prices by calculating average cost of production and adding a mark up for profit. Firms or businesses did not vary the mark-up with variations in the strength of market demand. This empirical finding of Hall and Hitch and later by Cyert, March, Fog, Sweezy, etc at different times has confirmed and strengthened the argument that prices are set in the manufacturing sector using what Scherer calls,

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1 Chamberlin, E.H. (1951).

2 Robinson, Joan. (1933).

"pricing rules of thumb"[3]. This findings was again confirmed in the studies carried out in the USA Kaplan et al,(1958) and in UK by Andrews (1949). They all contended that oligopoly was the main market structure of the business world.

These studies found that the precise method of price formation varied widely between firms and industries. In some cases the cost reference was either average prime or variable costs. But, the widely followed method was, `full cost' pricing. The other variants reckoned units costs at standard or normal levels of capacity utilization or of output. Depending on the basis of unit cost procedure the mark up or margin might cover a target for gross profits alone or would also include an allowance for fixed costs. Another finding of their studies was the stability of prices which could be explained by the competitive and monopoly models, only under restricted assumptions. Thus, the findings of Hall and Hitch apparently provided evidence against the pricing determination by equating MC with MR. Moreover it showed that the equation of MC and MR was an impractical operational procedure for fixing the price and mark up pricing.

A major distinction amongst the theories of the firms can be made between theories in which firms are essentially price takers" and those theories in which firms are "price makers".

For, in competitive markets, according to the neo classical tradition all sellers are price takers and in quasi competitive

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[3] Scherer, F.M. (1971).

industrial markets price adjustments are carried out by each firm unilaterally although not in isolation from its rivals. In price making theories prices are administered in the sense that the firm is pictured as determining and declaring, in pursuit of its objectives those prices at which it is ready to undertake its sales.

The marginalists assume that prices are determined at the point where MC = MR. In each period, the firm maximises its (short run) profit by setting its output and price at the level defined by the intersection of the MC and MR curve. Thus, the marginalists' view was repudiated by the empirical findings of Hall and Hitch, which concluded that the price is determined on the basis of average cost principle (or, full cost basis). It is also the right price as it includes a `fair profit' and this covered the costs of production when the plant was normally utilised.

The approach is based on the assumption of a representative firm and the likely responses of its rivals to a change in price. The conjectural demand curve facing the firm is such that in whatever direction it changes the price, the outcome of this change as a result of the response of the competitors is unfavourable and its total revenue will fall since its rivals will not follow it to benefit from its actions.

Thus, if the firm raises the prices its rivals would not follow and since in an oligopoly, the cross elasticity of demand is high their sales and revenue would fall off markedly.

Equally, if it lowers the prices, its rivals will feel obliged to match any price reduction and so, no firm will gain an increase in sales sufficiently to prevent total revenue falling. As a result the price remain sticky and output also does not change even as cost factors changes.

Hall and Hitch laid a good deal of stress on the kinked demand curve in the case of oligopoly by laying emphasis on sticky prices in the short run. They also pointed that the kink in the subjective demand curve makes the price at this point a profit maximising one. Price for a wide range of marginal costs on account of discontinuity in the marginal curve at this price was set equal to the average cost and the kink would occur at this price.

Thus, Hall and Hitch theory of pricing is a full cost theory which takes into account both prime and overhead costs. Kalecki[4] while discussing the price fixation by a firm stated that the actual level of overheads does not directly influence the determination of price since the total of overhead costs remains roughly stable as output varies' (, ,).

Kalécki observed that the firms fix the prices of the products taking into considerations the mobility of consumers (market imperfections) and the influence of their own prices on those of their rivals (oligopoly). Average cost plays a major role in the determintion of the price through their influence on 'gross margins' ie., in fixing the prices of the products the

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[4] Op.cit. (1971). p. 44.

firm takes into consideration its average prime costs and the price of the other firms producing similar products. Thus, for both Hall and Hitch and Kalecki, pricing decision are made on the basis of average (prime) costs. Only a different expression in Kalecki's model is that pricing decisions reflect the competitiveness (degree of monopoly) of the economic environment facing the decision maker.

In this regard, Sylos - Labini[5] argued that price tends to settle at the level immediately above the entry preventing price of the least efficient firms which is to the advantage of the largest and the most efficient firms to let live. From this above discussions it is clear that price is cost determined but not demand determined. While the price level is determined on the basis of mark-up over costs, the change in prices has the following logical structure.

As is well known, price changes, being a consequence of the influence of various factors, would occur differently in different market structures. In a perfectly competitive market structure prices change in the same direction as costs and demand. In a monopoly situation, however, price varies disproportionately with regard to changes in demand. Moreover, in the more prominent form of market structure, i.e., of the oligopolistic one, (and it being directly relevant to our study also) the prices do not change frequently and generally they are sticky downwards. It has also been observed that the influence

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[5] Sylos-Labini, P. (1969). P.50.

of demand in price changes is usually meagre.[6] During a boom (or recession) prices in oligopoly rise (or fall) in a lesser degree as compared to those in a competitive structure. Again, during boom, prices, with reference to cost, rise less in oligopoly as compared to the competitive market. Essentially, price changes in oligopoly could be quite different from that in a competitive industry. These observations are based upon a number of studies done in the industrial economies of Canada, United States and the U.K.[7]. Notwithstanding the variety of views on pricing behaviour in oligopolistic market structure, the most recent and probably a better accepted approach to this has been the CGN model, which we have used in our present work.

Once the price is determined on the basis of full cost, it becomes acceptable to all firms. At this equilibrium level each firm is in a position to calculate its mark-up. When the equilibrium condition changes, the price is to be changed. Normally this occurs without a price war, since exigencies wars are costly and major firms are willing to undertake them if only the expected gains are higher than expected costs, an occurrence that does not appear to be frequent.

An attempt has been made in this study to find out whether changes in price are likely to be affected by the level or changes in the pressure of demand. Alternative specifications were tested with demand expressed in terms of levels or changes with and without lag term. The proxy for demand is used for PUR

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[6] Eichner, A. (1973).

[7] Sawyer, Malcolm, C. (1983).

term mainly to find out the effect and role of past decisions which is expected to affect the present decisions in production conditions and which can have an effect on price.

Equation I(a) + 1($_b$) given below relates to cost and demand proxied by potential utilization ratio (PUR). I_b includes an additional lagged activity term. Equations II ($_a$) and II ($_b$), relate price changes to cost changes but to activity levels. Equation II) ($_b$) including an additional lagged activity term. Equation II ($_c$) relate price changes to cost changes and activity changes and II (d) includes an additional lagged activity term. These models are the same models used by Chatterji [1989].

LEVEL OF PRICE DETERMINATION:

I (a) $\ln Pt = \alpha_o + \alpha_1 t + b_1 \ln Ct + b2 \ln PURt$

(b) $\ln Pt = \alpha_o + \alpha_1 t + b_1 \ln Ct + b_2 \ln PURt + b_3 \ln PURt-1$

CHANGE IN PRICE DETERMINATION:

II (a) $\Delta \ln P_t = \alpha_o + b_1 \Delta \ln Ct + b_2 \ln PURt$

(b) $\Delta \ln P_t = \alpha_o + b_1 \Delta \ln Ct + b_2 \ln PURt + b_3 \ln PUR_{t-1}$

(c) $\Delta \ln Pt = \alpha_o + b_1 \Delta \ln Ct + b_2 \Delta InPURt$

(d) $\Delta \ln Pt = \alpha_o + b_1 \Delta \ln Ct + b_2 \Delta \ln PURt + b_3 \Delta \ln PUR_{t-1}$

SECTION II

3.2 EMPIRICAL RESULTS

The estimates of the above models are given below.

Table 3.1
Estimated Price Equation I (a)

Industry	α_o	α_1	b_1	b_2	$\bar{R}^2$	DW
Sugar	4.4 (1.79)	0.07 (2.15)	0.09 (0.21)	-0.27 (-0.92)	0.90	1.80
Paper	-0.47 (-0.66)	-0.02 (-1.24)	1.26 (7.21)	-0.12 (-1.97)	0.99	1.79
Textiles	-4.89 (-1.52)	-0.003 (-0.32)	0.97 (3.47)	1.12 (1.79)	0.98	2.01
Iron and Steel	-0.94 (-0.62)	-0.04 (-1.81)	0.89 (4.59)	-0.22 (-0.87)	0.99	1.78
Chemicals	1.44 (0.56)	0.05 (1.73)	0.75 (3.07)	-0.18 (-0.37)	0.99	1.91
General Engineering	1.102 (2.15)	0.022 (2.12)	0.73 (6.07)	-0.011 (-0.35)	0.99	2.07
Fertilisers and Pesticides	-2.39 (-1.96)	-0.19 (-0.99)	1.91 (8.74)	-0.19 (-0.99)	0.98	1.93
Cotton Spinning	6.92 (2.68)	0.02 (1.16)	0.07 (4.55)	-1.41 (-2.73)	0.98	1.83
Jute Textiles	1.19 (1.75)	0.03 (3.62)	0.61 (5.47)	0.05 (0.41)	0.98	1.59
Heavy Electricals	4.87 (3.02)	0.045 (2.07)	0.57 (2.08)	-0.77 (-3.10)	0.99	1.89
Heavy Vehicles	3.91 (2.93)	0.06 (3.11)	0.19 (1.25)	-0.17 (-0.77)	0.98	1.42
Bicycles and Motor Cycles	1.55 (-1.15)	-0.04 (-1.65)	1.23 (4.08)	-0.51 (-1.93)	0.93	2.16
Tobacco	-0.09 (-0.01)	-0.04 (-1.28)	1.49 (3.39)	-0.46 (-0.45)	0.74	1.88
Drugs and Pharmaceuticals	1.55 (0.90)	0.05 (1.64)	0.79 (2.35)	-0.28 (-1.29)	0.99	1.71

Note: If D-W ≥ 1.41 (1% level) then there is no autocorrelation. Figures without parantheses are estimated coefficients, those within parantheses are estimated `t' statistic.

The estimate of price equation 1 (a) is given in Table 3.1. As the D-W test shows that equation are not free from autocorrelation, we have reestimated all the equation using Cochrane - Orcutt method (CORC). Only the CORC estimates are reported here which are free from autocorrelation. All equations have very high explanatory power. The estimate shows that Chatterji's findings are still valid for all the industries she has included even for the extended period. In other words, her estimates are not sensitive to the period of study. However,if we use 10% level of significance, industries like paper and textiles have significant PUR term with opposite signs. The picture is different for the new sample of industries. The PUR term is significant on the price formation in cotton spinning, heavy electricals, bicycles and motor cycles (10% level). It is to be noted that the cotton spinning and heavy electricals are three digit classification of textiles and general engineering respectively. It is to be noted that cost terms are not significant in two industries - sugar and heavy vehicles.

Table 3.2
Estimated Price Equation I (b)

Industry	a_0	a_1	b_1	b_2	b_3	$\bar{R}^2$	DW
Sugar	5.87 (2.00)	0.073 (2.15)	0.003 (0.006)	-0.28 (-0.93)	-0.28 (-1.06)	0.98	1.77
Paper	0.05 (0.08)	-0.032 (-2.42)	1.50 (8.49)	0.26 (1.41)	-0.69 (-2.15)	0.99	1.69
Textiles	-2.35 (-0.41)	-0.006 (-0.25)	0.99 (3.41)	0.99 (1.34)	-0.45 (-0.64)	0.97	1.84
Iron and Steel	-0.13 (-0.18)	0.04 (1.75)	0.95 (5.06)	-0.03 (-0.44)	-0.03 (-0.46)	0.99	1.70

(Contd.....)

Industry	a_0	a_1	b_1	b_2	b_3	$\bar{R}^2$	DW
Chemicals	0.23 (0.10)	0.04 (3.09)	0.67 (4.12)	-0.54 (-1.11)	0.69 (1.48)	0.99	1.85
General Engineering	0.88 (1.37)	0.02 (1.16)	0.75 (3.71)	-0.06 (-0.46)	0.08 (0.44)	0.99	2.33
Fertilisers and Pesticides	-2.44 (-1.73)	-0.083 (-2.97)	1.91 (8.51)	-0.18 (-0.89)	0.005 (0.074)	0.98	1.93
Cotton Spinning	17.24 (4.44)	0.02 (1.81)	0.83 (4.33)	-2.05 (-3.98)	-0.67 (-3.16)	0.98	2.04
Jute Textiles	0.97 (1.07)	0.03 (3.12)	0.64 (5.37)	0.07 (0.53)	0.009 (0.07)	0.99	1.47
Heavy Electricals	4.77 (3.09)	0.05 (2.78)	0.48 (2.01)	-0.85 (-3.56)	0.18 (0.69)	0.99	1.67
Heavy Vehicles	3.798 (2.33)	0.07 (3.33)	0.17 (1.16)	-0.27 (-1.18)	0.12 (0.59)	0.98	1.46
Bicycles and Motor Cycles	2.20 (1.36)	-0.05 (-1.93)	1.4 (4.05)	-0.57 (-1.92)	-0.23 (-0.85)	0.93	2.06
Tobacco	-4.38 (0-.81)	-0.05 (-1.99)	1.64 (3.91)	-0.87 (-0.83)	1.28 (1.40)	0.76	1.66
Drugs and Pharmaceuticals	0.37 (0.16)	0.04 (1.36)	0.89 (2.58)	-0.21 (-0.94)	0.28 (1.27)	0.99	1.58

NOTE: If D-W ≥ 1.51 (1%) then there is no autocorrelation.
Figures without parantheses denotes coefficients and with parantheses represents 't' statistic.

The estimates of equation I (b) are given in Table 3.2. Even the CORC estimates of two industries - jute textiles and heavy vehicles - are not free from auto correlation. The cost term is significant in all the industries except for sugar and heavy vehicles. The lagged PUR term is significant in the paper industry while current terms becomes insignificant. In the case of cotton spinning both terms do play a role in the determination of prices.

Table 3.3
Estimated Price Equation II (a)

Industry	a_o	b_1	b_2	$\bar{R}^2$	DW
Sugar	2.15 (1.88)	0.11 (0.24)	-0.57 (-1.86)	0.12	2.12
Paper	0.73 (0.29)	1.37 (3.85)	-0.17 (-0.30)	0.51	1.94
Textiles	-5.50 (-1.97)	0.93 (2.92)	1.22 (1.98)	0.39	1.96
Iron and Steel	2.21 (1.91)	0.86 (4.64)	-0.49 (-1.89)	0.60	1.94
Chemicals	-0.73 (-0.33)	0.98 (3.09)	0.17 (0.34)	0.35	2.17
General Engineering	-0.05 (-0.34)	0.580 (2.34)	0.017 (0.56)	0.15	2.32
Fertilisers and Pesticides	1.11 (0.91)	1.86 (8.61)	-0.27 (-0.96)	0.77	2.01
Cotton Spinning	7.32 (2.92)	0.65 (2.27)	-1.62 (-2.92)	0.47	2.01
Jute Textiles	0.36 (0.91)	0.56 (5.96)	-0.08 (-0.80)	0.61	1.89
Heavy Electricals	-0.022 (0.03)	1.04 (2.9)	0.007 (0.04)	0.33	2.01
Heavy Vehicles	1.17 (1.12)	0.26 (2.19)	-0.26 (-1.07)	0.13	1.99
Bicycles and Motor Cycles	-0.07 (-0.06)	0.62 (1.15)	0.02 (0.07)	0.19	2.32
Tobacco	1.2 (6.37)	1.38 (3.44)	-0.28 (-0.37)	0.32	2.03
Drugs and Pharmaceuticals	0.58 (0.56)	0.77 (2.23)	-0.12 (-0.51)	0.21	1.99

Note: If D-W ≥ 1.305 (1% level) then there is no autocorrelation.
Figures without parantheses denotes coefficients and with parantheses represents 't' statistic.

The effect of change in cost and the level of demand on the change in price, equation II (a), is given in Table 3.3. The

explanatory power of the equations is not very high. All equations are CORC estimates and are free from autocorrelation. From this table it is clear that all cost changes are significantly related to price changes except sugar and bicycles and moter cycles. This implies that cost increase is transmitted to price changes in most of the industries. Only cotton spinning PUR has any significant effect on the change in price (5% level).

Table 3.4
Estimated Price Equation II (b)

Industry	α_0	b_1	b_2	b_3	$\bar{R}^2$	DW
Sugar	2.22 (1.69)	0.13 (0.26)	-0.55 (-1.61)	-0.04 (0.12)	0.08	2.12
Paper	-1.19 (-0.38)	1.41 (3.72)	-0.28 (-0.48)	0.54 (1.06)	0.51	1.93
Textiles	-4.99 (-1.64)	0.95 (2.83)	1.53 (1.99)	-0.42 (0.67)	0.38	1.99
Iron and Steel	2.11 (1.61)	0.85 (4.43)	-0.51 (-.10)	0.04 (0.16)	0.58	1.94
Chemicals	-1.65 (-0.75)	0.89 (2.89)	-0.31 (0.49)	0.68 (1.2)	0.36	2.19
General Engineering	-0.048 (-0.300)	0.58 (2.16)	0.016 (0.25)	0.0003 (0.004)	0.11*	2.32
Fertilisers and Pesticides	0.41 (0.23)	1.81 (7.47)	-0.27 (-0.96)	0.16 (0.54)	0.76	1.98

(Contd.....)

Industry	a_0	b_1	b_2	b_3	$\bar{R}^2$	DW
Cotton Spinning	4.68 (1.86)	0.59 (2.21)	-2.20 (-3.62)	1.17 (1.92)	0.51	2.18
Jute Textiles	0.34 (0.79)	0.55 (5.79)	-0.09 (-0.69)	0.024 (0.20)	0.60	1.88
Heavy Electricals	-0.60 (-0.97)	0.83 (2.95)	-0.56 (-2.41)	0.71 (3.14)	0.52	2.03
Heavy Vehicles	0.29 (0.21)	0.20 (1.45)	-0.31 (-1.26)	0.26 (0.97)	0.13	1.91*
Bicycles and Motor Cycles	-1.28 (-1.04)	0.72 (1.47)	-0.25 (-0.87)	0.54 (1.93)	0.28	2.56
Tobacco	0.06 (0.02)	1.17 (2.61)	-1.47 (-1.14)	1.46 (1.13)	0.32	1.97
Drugs and Pharmaceuticals	-0.12 (-0.09)	0.82 (2.21)	-0.24 (-0.93)	0.27 (1.06)	0.21	1.99

Note: If D-W ≥ 1.409 (1% level) then there is no autocorrelation.
Figures without parantheses are estimated coefficients, those within parantheses are estimated 't' statistic.

The effect of change in cost, in the current and lagged PUR on the price change is given in Table 3.4. All equations are CORC estimates and free from autocorrelation. Only in the case of heavy electricals, current and lagged PUR significantly influences price change, while the current effect is negative, the lagged effect is positive on the price change. Sugar, heavy vehicles and bicycles and motorcycles are the industries where cost terms are insignificant.

Table 3.5
Estimated Price Equation II (c)

Industry	a_o	b_1	b_2	$\bar{R}^2$	DW
Sugar	0.04 (0.89)	0.34 (0.68)	-0.19 (-0.67)	0.002	2.06
Paper	-0.02 (-0.69)	1.37 (3.92)	-0.43 (-1.006)	0.53	1.94
Textiles	0.013 (0.43)	0.86 (2.46)	0.89 (1.40)	0.33	1.96
Iron and Steel	0.03 (1.27)	0.93 (4.83)	-0.23 (-0.91)	0.55	1.87
Chemicals	0.03 (0.95)	0.88 (2.86)	-0.51 (-0.91)	0.37	2.18
General Engineering	0.03 (1.37)	0.64 (2.76)	0.02 (0.24)	0.14	2.33
Fertilisers and Pesticides	-0.06 (-2.69)	1.78 (8.18)	-0.22 (-1.08)	0.77	1.96
Cotton Spinning	0.03 (1.15)	0.69 (2.88)	-1.64 (-2.90)	0.46	2.13
Jute Textiles	0.04 (2.37)	0.56 (5.93)	-0.05 (-0.41)	0.61	1.84
Heavy Electricals	0.02 (0.86)	0.83 (2.90)	-0.65 (-2.92)	0.52	2.00
Heavy Vehicles	0.06 (2.14)	0.19 (1.47)	-0.29 (-1.47)	0.17	1.90
Bicycles and Motor Cycles	0.006 (0.14)	0.78 (1.58)	-0.39 (-1.58)	0.28	2.42
Tobacco	0.003 (0.05)	1.16 (2.71)	-1.47 (-1.23)	0.36	1.97
Drugs and Pharmaceuticals	0.05 (1.43)	0.81 (2.29)	-0.25 (-1.25)	0.25	1.99

Note: If D-W ≥ 1.305 (1% level) then there is no autocorrelation
Figures without parentheses denotes coefficients and with parantheses denotes 't' statistic.

The relationship between price change, cost change and demand changes are given in Table 3.5. All equations are CORC estimates and are free from autocorrelation. The change in cost

is not significantly related to change in price in the following industries - sugar, heavy vehicles, and bicycles, and motor cycles. In two of the industries heavy electricals and cotton spinning cost and demand changes are significantly influenced by the price change.

Table 3.6
Estimated Price Equation II (d)

Industry	a_o	b_1	b_2	b_3	$\bar{R}^2$	DW
Sugar	0.04 (0.87)	0.27 (0.53)	-0.22 (-0.78)	-0.29 (-1.20)	0.02	1.99
Paper	-0.03 (-0.74)	1.42 (3.72)	-0.30 (-0.63)	0.29 (0.62)	0.51	1.95
Textiles	0.004 (0.12)	0.94 (2.59)	0.82 (1.11)	-0.62 (-0.92)	0.31	1.95
Iron and Steel	0.040 (1.75)	0.81 (4.20)	-0.39 (-1.54)	-0.33 (-1.40)	0.53	1.72
Chemicals	0.03 (0.89)	0.86 (2.62)	-0.15 (-1.05)	0.41 (0.73)	0.37	2.12
General Engineering	0.005 (0.66)	0.84 (3.08)	0.14 (0.91)	-0.184 (-0.89)	0.15	2.35
Fertilisers and Pesticides	-0.07 (-2.74)	1.86 (7.62)	-0.23 (-1.07)	-0.112 (-0.51)	0.76	1.95

(Contd....)

Industry	a_o	b_1	b_2	b_3	$\bar{R}^2$	DW
Cotton Spinning	0.02 (0.81)	0.86 (3.78)	-2.19 (-4.62)	-1.78 (-3.71)	0.69	2.11
Jute Textiles	0.04 (2.18)	0.56 (5.78)	-0.007 (-0.05)	0.008 (0.06)	0.60	1.85
Heavy Electricals	0.032 (1.14)	0.72 (2.24)	-0.68 (-2.95)	0.14 (0.58)	0.49	2.11
Heavy Vehicles	0.06 (2.00)	0.18 (1.36)	-0.25 (-1.19)	0.15 (0.79)	0.14	1.87
Bicycles and Motor Cycles	-0.017 (-0.37)	1.05 (1.94)	-0.051 (-1.98)	-0.15 (-0.58)	0.32	2.34
Tobacco	-0.012 (-0.19)	1.23 (2.76)	-1.68 (-1.35)	0.88 (0.74)	0.35	2.05
Drugs and Pharmaceuticals	0.04 (1.26)	0.94 (2.98)	-0.14 (-0.64)	0.36 (1.74)	0.29	1.96

Note: If D-W ≥ 1.407 (1% level) then there is no autocorrelation.
Figures without the parentheses denotes coefficients and with parentheses denotes 't' statistic.

The estimates of equation of II (d) are given in Table 3.6. All equations are free from autocorrelation. Only in the case of cotton spinning the change in lagged PUR is significant. Cost terms are significant in all industries except in sugar, heavy vehicles, and bicycles and motorcycles.

SUMMARY

In this chapter, the validity of the price determination model in terms of cost and demand has been examined using data from the following industries during the period, 1959-1985/86: (i) sugar; (ii) paper; (iii) textiles further disaggregated into cotton spinning and jute textiles; (iv) iron and steel; (v) chemicals further disaggregated into drugs and

pharmceuticals,fertilisers and pesticides; (vi) general engineering further disaggregated into heavy electricals and heavy vehicles and (vii) bicycles and motorcycles and tobacco.

The results support the hypothesis that the prices are cost determined in most of the industries. Price is neither cost determined nor demand determined in sugar and heavy vehicles. The only significant term in these industries is the `time'. This would suggest that factors other than cost and demand are significantly determine the price level in these industries and this needs further investigation. Paper is the only industry where lagged but not current demand influences the price level. But in cotton spinning, both current and lagged demand influence the pricing decision.

The empirical results on the relationship between price change, cost change and level of demand show that main source of price change is cost change. Only in cotton spinning,the levl of demand affects the price change. The changes in price cannot be explained by the change in cost and the level of demand on sugar,and bicycles and motorcycles industry. Introduction of lagged demand term in the specification does not change our findings much. However, the lagged demand in the heavy electrical industry makes the demand (lagged and current) term significant in determining the price changes. The specification and estimation of change in prices in terms of changes in cost and demand show that only in cotton spinning changes in cost and demand affect price changes.

All other industries the price change is mainly due to the cost change. The exceptions are sugar,heavy vehicles and bicycles and motorcycles. Lagged demand changes influences price change only in cotton spinning.The empirical analysis clearly indicates that the price change in sugar,bicycles and motorcycles and in heavy vehicles and this need careful study on the factors that determine the cost.

CHAPTER IV

INTER-TEMPORAL BEHAVIOUR OF MARK-UP: 1959 TO 1985/86

The empirical findings in Chapter III assume that the price-cost relationship is constant during the period of analysis. But the industrial sector has changed structurally as a result of the liberalisation measures introduced by the government during the 70's. Therefore, the constancy of mark-up during the period is not a realistic assumption. The present chapter examines the impact of the policy measures on the constancy of mark-up during the period under study.

The impact is measured using trend analysis of mark-up before and after the introduction of such policy measures without examining the theories on mark-up. For this purpose, the period has been divided into two sub-periods: period I, 1959-73 and period II, 1974-1985/86.

The policy initiatives taken in period I (1959-73) include tariffs, quantitative restrictions on imports, complicated system of industrial licensing, coupled with a system of restrained foreign exchange allocation. In addition to this, there also existed a series of price and distribution controls over certain essential key industrial inputs.

The industrial licensing policy and import control policies implemented during this period had served only to eliminate competition and allocation of import licenses on the basis of existing capacity had created an artificial and wasteful incentive to overbuild capacity. This policy strategy has

favoured producing for relatively profitable domestic markets and against exporting. As a result of this, the stated objectives were not fulfilled and it has contributed to widespread economic inefficiencies in resource allocation, increased concentration of income and wealth, etc., which have eventually led to the review of the industrial policy in the form of liberalization which was initiated in 1973 particularly with the revision of industrial licensing policy.[1]

The policy initiatives taken since mid-seventies towards liberalization such as delicensing, broadbanding, automatic expansion, raising asset limit for MRTP units, etc., should have increased the efficiency of the industrial sector. The first aspect of liberalization strategy was introduced in the form of (i) increasing the area of licensing; (ii) as a result of which 25 industries and product groups have been delicensed; (iii) announcing exemptions from the operation of the convertibility clause; (iv) textile policy has been recast in order to enable the mill sector to improve its position; and (v) liberalisation of technology imports. The second aspect has been (i) the increasing use of 'broad banding' of product groups, rather than for individual item; (ii) relaxation of limit for industrial units or groups regarding the registration under the MRTP Act. The third aspect of the liberalisation policy was regarding the relaxation of price restricting through either abolition of price control in certain cases or the adoption of the system of dual prices with a substantial part of the output of the concerned industries being left to be sold in the free market.

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[1]. Paranjape, H.K. (1985).

The effect of such policy measures on the mark-up behaviour needs careful examination. For this purpose, the chapter has been divided into three sections. In Section I, a brief review of the theories are given. Section II deals with the measurement of mark-up and presents the empirical results. Section III provides a tentative explanation for the empirical results.

SECTION I

4.1 THEORETICAL ISSUES

As explained in Chapter I, the empirical findings of Hall and Hitch revealed that under oligopolistic market conditions, many of the firms set their prices by adding a certain percentage of mark-up to their average total costs of production, which later came to be known as 'cost plus pricing principle'. This observation was later substantiated in the studies of large American corporations by the Brookings Institution and the Senate Antitrust and Monopoly (Kefauver) Sub-committee. These findings, in other words, implied that firms were able to set their prices without taking into consideration the demand conditions. However, Hall and Hitch do not provide a theory of mark-up. Kalecki's pricing model postulated that the mark-up is determined by the 'degree of monopoly'. However, Kalecki also did not provide a theory of mark-up.

Eichner(1973) has given a theory in the cost plus tradition. Given the price setting power within the industry, he postulated that the size of the mark-up depends on the demand for and supply of additional investment funds by the firms or

group of firms. Because of its market power, the price leader could finance its intended investment expenditure by increasing the margin above the costs. There are a number of empirical studies that try to correlate profitability used in the sense of average gross mark-up and factors like concentration, entry barriers, etc.

In the structure-conduct-performance paradigm, there are two major hypotheses - market power hypothesis, and efficiency hypothesis. According to the former it is the market power that leads to higher prices and profits, whereas the latter states that it is the greater efficiency that gives rise to both higher profits and higher concentration. Clarke, Davies and Waterson[2] tested these conflicting hypotheses empirically using the UK data. They found that the evidence of their analysis was more consistent with the traditional market power explanation of profitability concentration correlation at the industry level. They examined the implications of the relationship both at the inter and intra industry levels. They also found that both efficiency and market power effects are at work, i.e., greater cost efficiency leads to both higher profitability and incidentally to greater concentration. However, one cannot say anything conclusive about the nature and direction of causality between profitability and the other variables mentioned above.

Under such circumstances, especially when the firm level data it is difficult to obtain, the inter-temporal behaviour of the mark-up in the structure-conduct-performance framework.

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[2] Clark, R. Davies, S.W. and Waterson, M. (1984).

Therefore, the study tries to look into the behaviour of the mark-up by using trend specification models. And the explanation is based mostly on the Hall and Hitch model.

SECTION II

4.2 MEASUREMENT OF MARK-UP AND EMPIRICAL RESULTS

In the estimation of the trend, the calculation of mark-up becomes very crucial. Two measures are available for calculating mark-up.

Measure:1.

In first measure calculation of mark-up involves price minus prime cost, per unit of output. The transaction price was calculated by deflating the value of the output (Annual Survey of Industries) by the volume of output (Index of Industrial Production). Prime cost is the weighted average of the wholesale prices of the material inputs [for which weights were derived from input-output table (1973-74)]. The total emoluments includes wages (workers) and salaries (other than workers) which is obtained from the ASI.

Measure 2:

The mark-up based on Measure: 1 was obtained by deflating the value of output (ASI) by volume of production (IIP) which is questionable. Therefore, we have used an alternative measure (Measure: 2) to obtain the mark-up and the following discussion presents the method of calculating the mark-up.

This model is similar to Lerner's[3] definition of the degree of monopoly power, (price minus marginal cost)/price. It is defined as

(Total sales - Total cost)/Total sales,

where total sales includes value of output and production cost equals raw material cost plus manufacturing cost plus employee expenses. The limitation of this measure is that adjustments are not made for depreciation and it is not net capital cost, as it is difficult to obtain data on capital costs.

We have used here linear trend in mark-up for the study period for the selected sample industries. In order to measure the change in the mark-up due to liberalisation measures, we have used dummy variables specification for the two periods. The four variants the trend model are given below:

Variant I

If the trend of mark-up remains the same for the entire period, the equation is,

$$Mt = a_0 + a_1 t$$

Variant II

If the level of mark-up changes in the second period, then the specification becomes,

$$Mt = a_0 + a_1 t + a_2 D$$

$D = 0$ if $1959 \leq t \leq 73$

$= 1$ if $1974 \leq t \leq 85$

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[3] Lerner, A.P. (1934).

Variant III

If the rate of mark-up changes in the second period, then the specification becomes,

$$Mt = a_0 + a_1 t + a_3 tD$$

Variant IV

If both level and rate change in the second period, then the specification becomes,

$$Mt = a_0 + a_1 t + a_2 D + a_3 tD$$

All the four variants were estimated and the results are given below. Wherever, Durbin - Watson test shows significant autocorrelation, then Cochrane-Orcutt method (CORC) was used for its correction. Since there is no data for 1972, the year is excluded for the analysis. The estimates of the variant I are given in Table 4.1.

Table 4.1
Estimation of Trend, Variant 1

Industry	a_0	$a_1 t$	$\bar{R}^2$	DW
Sugar	0.14 (9.6)	-0.002 (-2.2)	0.20	1.45
Textiles	0.08 (5.31)	0.001 (1.25)	0.02	2.32
Paper	0.15 (6.63)	0.0003 (0.17)	-0.04	1.45
Chemicals	0.26 (9.8)	-0.004 (-2.2)	0.14	1.91
Iron& Steel	0.12 (6.5)	0.0002 (0.15)	-0.04	1.14
CORC	0.09 (3.4)	0.002 (1.1)	0.11	2.01

(Contd....)

Industry	a_o	a_1 t	$\bar{R}^2$	DW
General Engg.	0.45	-0.01	0.60	0.94
	(14.6)	(-6.24)		
CORC	0.48	-0.01	0.71	2.14
	(8.0)	(-3.85)		
Fert.& Pest.	0.01	0.003	0.32	1.23
	(6.7)	(3.6)		
CORC	0.09	0.003	0.39	1.94
	(3.7)	(2.31)		
Cotton Spng.	0.10	-0.0003	-0.032	1.02
	(8.00)	(-0.46)		
CORC	0.09	-0.00003	0.13	1.81
	(3.96)	(-0.02)		
Jute Txls	0.08	0.0008	-0.02	1.42
	(4.2)	(0.67)		
CORC	0.06	0.,002	0.04	1.68
	(2.51)	(1.2)		
Heavy Elecls	-2.74	0.2	-0.69	0.70
	(-9.11)	(7.6)		
CORC	-2.44	-0.13	0.79	1.88
	(-3.1)	(-2.9)		
Heavy Vehls	0.15	0.0007	-0.005	1.1
	(11.9)	(0.93)		
CORC	0.13	0.002	0.23	1.81
	(6.9)	(1.65)		
BC & MC	0.084	0.002	0.004	1.35
	(3.45)	(1.08)		
CORC	0.13	-0.0007	-0.060	1.17
	(9.2)	(-0.80)		
Tobacco	0.20	-0.001	-0.03	2.16
	(6.2)	(-0.6)		
Drugs & Pharma.	0.3	-0.005	0.76	1.69
	(32.8)	(-8.9)		

Note: i. If D-W ≥ 1.45,(5% level) the trend equation has no autocorrelation.
ii. If 't' ratio≥ 2.06(5% level with 24 degrees of freedom) then the regression coefficient is significant.
iii. The values in the brackets denotes `t' ratios.

Even though the trend equation have no autocorrelation in Table 4.1, three of the industries -paper,bicycles and motor-cycles, tobacco-have negative $\bar{R}2$. This simply means that the

trend equation hardly explain any variability in the mark-up of these industries. On the other hand, three industries-general engineering, heavy electricals, drugs and pharmaceuticals - have a very high $\bar{R}2$. This means that a large part of the variability in mark-up is explained by the trend equation in these industries. Sugar,chemicals,general engineering and heavy electricals show a declining trend in mark-up during the period.It should be noted that only fertilisers and pesticides industry shows a positive trend in the mark-up. The mark-up in the following industries-iron and steel, cotton spinning and jute textiles - remains constant during the period since the intercept term in the trend equation is significant.

Table 4.2
Estimation of Trend, Variant II

Industry	a_0	$a_1 t$	$a_2 D$	$\bar{R}^2$	DW
Sugar	0.14	-0.002	0.02	0.17	1.48
	(8.4)	(-1.8)	(0.06)		
CORC	0.111	-0.0008	-0.006	0.02	2.18
	(7.6)	(-0.6)	(-0.3)		
Textiles	0.084	0.0009	0.006	-0.02	2.34
	(4.5)	(0.45)	(0.2)		
Paper	0.18	-0.004	0.074	0.04	1.50
	(6.8)	(-1.40)	(1.73)		
CORC	0.16	-0.03	0.007	0.02	1.85
	(4.8)	(0.73)	(1.3)		
Chemicals	0.26	-0.0002	-0.04	0.11	1.93
	(7.9)	(-0.65)	(-0.52)		
Iron& Steel	0.15	-0.006	0.11	0.33	1.97
	(8.8)	(-3.2)	(3.8)		
General Engg.	0.42	-0.007	-0.101	0.64	1.20
	(12.1)	(-1.74)	(-1.78)		
CORC	0.47	-0.013	-0.018	0.70	2.11
	(6.66)	(-1.99)	(0.22)		
Fert.& Pest.	0.122	-0.0009	0.08	0.49	1.65
	(8.2)	(-0.54)	(3.03)		

(Contd.....)

Industry	a_0	$a_1 t$	$a_2 D$	$\bar{R}^2$	DW
Cotton Spng.	0.111	-0.002	0.03	-0.023	1.29
	(7.5)	(-1.19)	(1.11)		
CORC	0.09	0.001	-0.023	0.10	1.80
	(2.3)	(0.44)	(-0.53)		
Jute Txls	0.094	-0.002	0.06	0.05	1.43
	(4.6)	(-1.11)	(1.7)		
CORC	0.08	-0.001	0.050	0.07	1.60
	(2.8)	(-0.5)	(1.31)		
Heavy Elecls	-3.2	0.22	-1.3	0.74	1.01
	(-9.7)	(6.4)	(-2.4)		
CORC	-2.64	0.16	-0.4	0.78	1.86
	(-3.34)	(2.6)	(-0.54)		
Heavy Vehls	0.16	-0.003	0.06	0.22	1.58
	(13.1)	(-1.92)	(2.9)		
BC & MC	0.084	0.002	0.002	-0.04	1.35
	(2.9)	(0.53)	(0.004)		
CORC	0.143	-0.003	0.05	0.09	1.45
	(9.2)	(-2.14)	(2.05)		
Tobacco	0.196	-0.0004	-0.02	-0.07	2.15
	(5.1)	(-0.09)	(-0.24)		
Drugs & Pharma.	0.28	-0.005	-0.004	0.75	1.66
	(27.3)	(-4.2)	(-0.22)		

Note: i. D.W ≥ 1.55(5% level) 2 explanatory variables,sample size, 26 .
ii. `t'≥ 2.06 (5% level, with 23 degrees of freedom)

The estimated trend equation, variant II, is given in Table 4.2. As in the case of Table 4.1, the autocorrelation is adjusted using Cochrane Orcutt method (CORC). The results show that the intercept dummy is significant in the following industries: iron and steel,fertilizers and pesticides and heavy vehicles.

In the case of bicycles and motorcycles the CORC equation is not free from autocorrelation, since D-W falls in the inconclusive region. Therefore,the effect is uncertain. The trend equation of iron and steel dramatically changes the explanatory

power and the behaviour of the mark-up between the two sub-periods. The level of mark-up not only changed substantially, but also indicates a negative trend as a result of periodisation. In the case of fertilisers and pesticides,the positive trend has disappeared and shows a constant mark-up for the sub periods. This implies that the mark up in the industries either show a declining trend or remain constant during the period of analysis.

Table 4.3
Estimation of Trend, Variant III

Industry	a_0	$a_1 t$	$a_3 tD$	$\bar{R}^2$	DW
Sugar	0.15 (8.1)	-0.005 (-2.2)	0.002 (1.2)	0.21	1.55
Textiles	0.08 (3.8)	-0.002 (-0.6)	0.0004 (0.20)	-0.2	2.32
Paper	0.2 (5.4)	-0.002 (-0.6)	0.002 (0.7)	-0.06	1.42
CORC	0.14 (3.2)	0.0003 (0.006)	0.0009 (0.3)	-0.05	1.85
Chemicals	0.25 (6.8)	-0.001 (-0.3)	-0.002 (-0.7)	0.12	1.95
Iron& Steel	0.17 (9.30)	-0.001 (-3.87)	0.007 (4.33)	0.40	2.2
General Engg.	0.42 (10.3)	-0.008 (-1.58)	-0.004 (-1.1)	0.61	1.04
CORC	0.49 (5.30)	-0.016 (-1.72)	0.001 (0.22)	0.70	2.18
Fert.& Pest.	0.13 (7.24)	-0.002 (-0.72)	0.004 (2.6)	0.45	1.51
CORC	0.170 (4.7)	-0.002 (-0.51)	0.004 (1.8)	0.44	1.92
Cotton Spng.	0.114 (6.73)	-0.002 (-1.15)	0.002 (1.06)	-0.03	1.26
CORC	0.010 (1.31)	0.003 (0.58)	-0.0021 (-0.66)	0.11	1.83
Jute Txls.	0.104 (4.5)	-0.004 (-1.33)	0.004 (1.8)	0.06	1.47
CORC	0.084 (2.62)	-0.002 (-0.55)	0.003 (1.12)	0.05	1.60

(Contd...)

Industry	a_0	a_1 t	a_3 tD	$\bar{R}^2$	DW
Heavy Elecls.	-3.54	0.28	-0.10	0.80	1.29
	(-10.94)	(7.3)	(-3.7)		
CORC	-3.3	0.24	-0.07	0.80	1.91
	(-5.4)	(3.8)	(-1.8)		
Heavy Vehls.	0.18	-0.005	0.004	0.38	1.99
	(14.0)	(-3.14)	(3.98)		
BC & MC	0.084	0.002	0.00005	-0.04	1.35
	(2.6)	(0.42)	(0.02)		
CORC	0.16	-0.006	0.004	0.34	2.11
	(10.4)	(-3.6)	(3.64)		
Tobacco	0.18	0.002	-0.003	-0.04	2.19
	(4.1)	(0.5)	(-0.77)		
Drugs & Pharma.	0.3	-0.004	-0.0009	0.76	1.65
	(23.98)	(-2.7)	(-0.998)		

Note: The significant results are the same as in the case of Table 4.2.

The estimated trend equation, variant III, is given in Table 4.3. The empirical results show that only in these industries- iron and steel,heavy vehicles,bicycles and motorcycles - the slope dummy is significant. In the case of iron and steel the slope effect is positive. Therefore,the rate at which the mark up declines is less in the second period compared to the first period. The slope dummy dramatically increases the explanatory power of the trend in mark up in the bicycle and motorcycle industry compared to the earlier versions of the trend specification.

Table 4.4
Estimation of Trend, Variant IV

Industry	a_0	$a_1 t$	$a_2 D$	$a_3 tD$	$\bar{R}^2$	DW
Sugar	0.16	-0.005	-0.07	0.006	0.22	1.61
	(8.1)	(-2.4)	(-1.13)	(1.52)		
CORC	0.12	-0.002	-0.03	0.002	-0.02	2.15
	(6.4)	(0.9)	(-0.66)	(0.61)		
Textiles	0.073	0.002	0.06	-0.004	-0.03	2.41
	(3.31)	(0.88)	(0.9)	(-0.85)		
Paper	0.14	0.0004	0.3	-0.011	0.16	1.77
	(4.9)	(0.12)	(2.7)	(-2.1)		
Chemicals	0.24	-0.0008	0.03	-0.004	0.08	1.95
	(6.3)	(-0.2)	(0.23)	(-0.5)		
Iron& Steel	0.17	-0.009	0.013	0.006	0.38	2.2
	(8.55)	(-3.6)	(0.19)	(1.64)		
General Engg.	0.44	-0.009	-0.24	0.009	0.64	1.28
	(10.8)	(-2.07)	(-1.79)	(1.13)		
CORC	0.55	-0.02	-0.26	0.02	0.71	2.24
	(5.2)	(-1.96)	(-1.28)	(1.18)		
Fert.& Pest.	0.12	-0.0006	0.08	-0.0005	0.47	1.65
	(6.6)	(-0.32)	(1.4)	(-0.15)		
CORC	0.12	-0.0003	0.083	-0.008	0.45	1.93
	(4.23)	(-0.09)	(1.12)	(-0.18)		
Cotton Spng.	0.11	-0.002	0.02	0.0004	-0.07	1.29
	(6.2)	(-0.99)	(0.34)	(0.13)		
CORC	0.056	0.05	0.04	-0.005	0.07	1.86
	(0.64)	(0.53)	(0.25)	(-0.43)		

(Contd.....)

Industry	a_0	$a_1 t$	$a_2 D$	$a_3 tD$	$\bar{R}^2$	DW
Jute Txls	0.01	-0.004	0.02	-0.003	0.02	1.47
	(4.10)	(-1.20)	(0.21)	(-0.56)		
CORC	0.07	-0.0009	0.07	-0.001	0.02	1.61
	(1.95)	(-0.21)	(0.66)	(-0.16)		
Heavy Elecls	-3.84	-0.31	3.23	- 0.27	0.87	1.84
	(-14.0)	(-9.6)	(3.6)	(-5.3)		
CORC	-4.0	0.33	3.43	-0.3	0.85	2.00
	(-12.1)	(8.8)	(3.6)	(-5.2)		
Heavy Vehls	0.17	-0.004	-0.03	0.005	0.33	1.99
	(11.3)	(-2.2)	(-0.67)	(2.1)		
BC & MC	0.084	0.002	-0.0003	0.0002	-0.08	1.34
	(2.4)	(0.4)	(-0.02)	(0.03)		
CORC	0.18	-0.01	-0.09	0.009	0.47	2.57
	(11.3)	(-4.4)	(-2.4)	(3.9)		
Tobacco	0.16	0.004	0.160	-0.011	-0.04	2.33
	(3.6)	(0.74)	(1.1)	(-1.31)		
Drugs & Pharma	0.27	-0.003	0.06	-0.004	0.77	1.96
	(23.1)	(-2.3)	(1.63)	(-1.92)		

The final version of the trend equation, variant IV, is given in the Table 4.4. There is not even a single industry for which both intercept and slope dummy are significant. This implies that the trend equation cannot be separately estimated for the two sub-periods.

SECTION III

4.3 EXPLANATION OF THE EMPIRICAL RESULTS

This section deals with an explanation of the observed behaviour of the mark up emerging out of the trend analysis. In order to do that a summary of the results are given in Table 4.5. The broad findings are given below.

Table 4.5 SUMMARY OF TREND ANALYSIS

Industry Input Based/Use Based	Trend for the entire period	Intercept dummy	Slope dummy	Intercept and slope dummy
Sugar	Negative	-	-	-
Textiles	Constant	-	-	-
Paper	Constant	-	-	-
Iron&Steel*	Constant (Negative)	+	+	-
Chemicals	Negative	-	-	-
Gen.Engg.	Negative	-	-	-
Fert&Pest **	Positive(Constant)	+	-	-
Cotton Spng.	Constant	-	-	-
Jute Txls.	Constant	-	-	-
Heavy Elecls.	Negative	-	-	-
Heavy Vehls.***	Constant (Negative)	+	+	-
Tobacco	Constant	-	-	-
Drugs&Pharma	Negative	-	-	-
BC&MC *****	Constant (Negative)	-	+	-

Source: Tables 4.1, 4.2, 4.3,& 4.4

Note: `-' denotes insignificant, `+' denotes significant.
* The trend becomes negative when dummy variable is introduced -for eihter intercept or slope.
** With intercept dummy, the trend becomes constant.
*** With slope dummy,the trend becomes negative.
**** With slope dummy,the trend becomes negative.

Among the fourteen industries, the mark-up remains constant in eight, declines in five and increases in one during the entire period. The introduction of dummy variable for the second sub period has changed the nature of the mark-up in industries from constant to negative in iron and steel, heavy vehicles and bicycles and motor cycles. Specifically, eight industries have shown a decline and remaining six a constant trend.

The results obtained shows that the mark up is constant for he industries like paper, textiles, cotton spinning jute textiles,and tobacco, negative trend for industries like sugar chemicals, drugs and pharmaceuticals, general engineering and heavy electricals and positive trend only for fertilisers and pesticides. But, with an introduction of slope and intercept dummy, the results are different. Industries like iron and steel,heavy vehicles, bicyles

and motor cycles which showed constancy, becomes negative. Fertilisers and pesticides is the only industry which showed positive trend but shows a constant mark-up once the dummy variables are used.

During the period,the average cost for all the industries have gone up as shown in Table 4.6.

Table 4.6 Estimate of Period wise Average Cost.

Industry	Average Cost Period(I)	Average Cost Period(II)
Sugar	82	135
Textiles	80	197
Paper	83	237
Iron & Steel	80	247
Chemicals	82	213
General Engg.	83	229
Fert & Pest.	88	170
Cotton Spinning	79	168
Jute Textiles	79	184
Heavy Elecls.	83	203
Heavy Vehicles	75	367
BC & MC	83	248
Tobacco	91	120
Drugs & Pharma.	79	220

Based on the analysis in Chapter III and IV, and the change in cost, the industries can be classified into three groups, for the purpose of providing an analytical framework.

Group I: Mark-up remains constant; cost increases in the second period; the potential utilization ratio (PUR) is not significantly related to price. Industries like jute textiles,tobacco and fertilisers and pesticides fall in this group.

Group II: Mark-up remains constant; cost increases in the second period; PUR is significantly related to price. Industries like paper,textiles and cotton spinning belong to this group.

Group III: Mark-up declines and cost declines in the second period. PUR has significant effect in two industries - heavy electricals, bicycles and motor cycles - and no effect in the remaining six industries (sugar, chemicals, drugs and pharmaceuticals, iron & steel, general engineering and heavy vehicles.

The behaviour of the three groups can be explained using mark-up theories [Hall & Hitch,(1939)], Kalecki (1940)], and/the structure -conduct - performance approach which was discussed in brief in Chapter I. Our intrepretation follows Hall & Hitch tradition.

The mark up behaviour of the first group can be explained if we assume that the market structure remains the same. Under the assumption,the mark-up remains more or less constant.

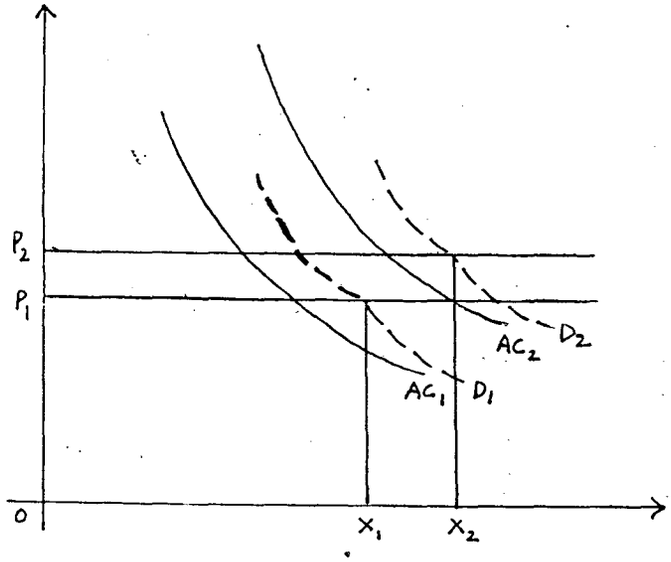
But,

Price = Cost + Mark-up,

Therefore, Change in Price = Change in cost + 0, since the mark-up is constant. This implies any change in cost in these industries will be transferred to a price change. This provides a framework for the constancy of mark up, change in price and change in cost during this period.

The mark-up in the second group of industries is explained by using a modified form of Hall& Hitch diagram given in Fig.1. We have introduced a shift in the AC and in kinked demand curve in the second period. The mark-up is drawn in such a way that it is constant for the two periods and the price change is same as cost change. The diagram explain a constant mark-up, a change in demand and change in cost.

FIG.1. Modified Hall and Hitch Model.



Source: Adapted from Hall and Hitch [1939] P.24.

The analysis is based on the assumption that the potential utilisation ratio is a proxy for demand in the Indian context. However,there exists evidence to beleive that the excess capacity has been increased to pre emept competition in India.In such a situation the use of such a proxy is highly questionable. The negative trend in mark up in industries like sugar,chemicals, drugs and pharmaceuticals,general engineering and heavy electricals could be due to expansion of productive capacity of the existing firms,to prevent the entry of new firms. The decline in mark up in group III industries can be explained due to increased competition.

Following is a set of tentative explanations for declining in the mark-up in certain industries, based upon available few case studies. The decline in the mark-up in sugar industry can be due to state intervention (control, decontrol, and partial control) in the form of control in form of levy and free sale sugar[4] by varying the respective proportions.

General engineering covers a large number of heterogeneous but closely connected group of industries. The engineering industry is primarily a metal using industry though other materials like plastics, nylon, rubber etc., are also used as inputs. As this industry requires large capital investments they are usually confined to a small number of giant enterprises who coexist with numerous small producers.The reason for decline in mark-up can be due to the entry of a large number of small firms and also high degree of subcontracting.

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[4] Baru, Sanjaya. (1990).

Drugs and pharmaceuticals industry is the most severely regulated among all the manufacturing industries. Bulk drugs and formulations are under drug price control order. While there is a rigid control on the prices of finished products there is no control over the inputs prices at all. The price control have been quite effective for the past two decades or so. In 1962, a price freeze was introduced and later, in 1970 with some modification, drug price control order (DPCO) was framed which divided drug formulations into two categories, essential and non essential. The first category was allowed a mark-up of 75% and the second 150%. Later it was followed by drug price control orders in 1978 and 1979[6]. The decline in mark-up in this industry can be due to the following reason.

Government role in controlling the prices of final products and not allowing these price to fluctuate according to the change in prices of inputs and the implementation of various Drug price control orders in 1978 and 1979 would have acted as a constraint on of high profits.

Heavy vehicles industry includes cars, buses, jeeps and trucks. The increase in mark-up in this industry is explained in terms of its market shares and government policy measures. The market share of passenger cars is dominated by two producers from 1948 to 1983. The decontrol of jeeps and commercial vehicles after 1968 and for passenger cars in 1975 may have increased competition resulting in the decline in mark-up.

The motorcycle segment was more or less equally shared by two

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[6] Panikar, P.G.K. Mohanan Pillai, P. and Sundari, T.K. (1990). p.68.

firms in various proportions. The motor cycle industry till 1970, was dominated by three firms, after which it spread over a number of firms with the major share of three. The three wheelers industry was dominated by one firm in 1960 and then the market share was split between two firms[6]. As a bicycle industry the concentration amongst the existing four firms has increased over time[7].

The decline in mark-up in both the bicycle and motor cycle industry can be attributed to increased competition between few firms.

SUMMARY

In this chapter an attempt has been made to trace intertemporal behaviour of mark-up for the two sub periods 1959-73 and 1974-85/86 by using trend specification and dummy variables.

The results also show that liberalization measure has reduced the mark up in some of the selected industries. An interesting finding was that the agro-based industries, while following cost-plus pricing (as others), show constancy in mark-up.

As there exists intra-industry differences in the selected sample industries, each industries required a detailed data at the firm level to know the impact of policy measures. Moreover,the degree of liberalisation can be different for different industries due to partial control and decontrol. Moreover, the response of different industries to the liberalisation measures can work at with different lags. However, a detailed analysis to ascertain the factors responsible for mark-up movement could not be undertaken in this study due to paucity of data.

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[6] Narayana, D. (1989). pp.27-32.

[7] Singh, Sukhpal, (1988).

CHAPTER V

SUMMARY AND SUGGESTIONS

The determinants of industrial pricing and its behaviour have a strong impact on an economy. Variations in industrial prices in relation to demand and cost have become crucial and has led to interesting discussions in economics in recent years, as it has different implications at both aggregate and disaggregate levels of economic activity. In the introductory chapter we have critically reviewed the available literature relating to the above issue.

The main purpose of the present study has been to analyse the factors affecting industrial prices and the inter-temporal behaviour of the mark-up in certain selected industries in the registered manufacturing sector. The price determination model used in the present study is based on Chatterji's (1989), which has been developed on the basis of the widely acclaimed model of Coutts, Godley and Nordhaus (1978). The validity of the model, for both level and change, is again tested for a different period, 1959-85, for the same set of industries included by Chatterji and for some additional industries at a disaggregated level. The industries chosen in her study were: (i) sugar; (ii) paper; (iii) textiles; (iv) iron and steel; (v) chemicals; and (vi) general engineering. We have included two more industries tobacco and bicycles and motorcycles which enjoyed a steady increase in demand during the period. In addition we have examined the validity of the model by disaggregating textiles into cotton spinning and jute textiles; chemicals into drugs and pharmaceuticals, fertilisers and pesticides; and general

engineering into heavy electricals and heavy vehicles. The details of the methodology used, data sources and description regarding both industries and period chosen have been presented in Chapter II.

The empirical results of the price determination model is given in Chapter III. Irrespective of the industries and the study period chosen, the results of the majority of the selected sample industries in this study are in confirmity with the established hypothesis that price determination is predominantly based on the cost factor. Industries like sugar and heavy vehicles show neither cost nor demand factor to be significant; this implies that factors other than the above two could have played a significant role and this requires an industry specific enquiry. The most distinct result concerns the cotton spinning industry where both current as well as lagged PUR term influence the price determination.

The equations which were tried in terms of levels show that the level of prices is also determined by the cost element.

The equations which were tried in terms of change show that cost change is fully transmitted to price change. Two of the industries - sugar, bicycles and motorcycles - show that the change in price is influenced neither by changes in cost nor by demand. This needs further investigation.

Chapter IV tries to find out the inter-temporal behaviour of average gross mark-up. Besides this, the effect of liberalisation

on the behaviour of the mark up is also tested for the two sub-periods (1959-73 and 1974-1985/86) using dummy variable technique.

The results show that the liberalisation measure has reduced the level of mark-up in some of the industries. Majority of them shows a constant mark-up. Specifically, without periodisation sugar, drugs and pharmaceuticals and heavy electricals show a negative trend in mark-up. Fertilisers and pesticides is the only industry which shows a positive trend in mark-up. While for the rest, the trend remains constant. When the periodisation is introduced, industries like fertilisers and pesticides shows constancy, iron and steel, heavy vehicles and bicycles and motorcycles show a negative trend in mark-up. An explanation of this behaviour is given on the basis of Hall and Hitch kinked demand curve model and competitive behaviour.

However, the study has the following limitations. Although we have used only a single source of data for the study, there still remains the difficulty in comaparability of the data due to the change in the (i) ASI classification system (from Standard Industrial Classification (SIC) to National Industrial System (NIC) in 1973/74) and (ii) the coverage of individual industries during the period. Moreover, as data on census sector are not available separately after 1982, we have used factory (census plus sample sector) data for the period 1982-1985/86. The empirical validity of the mark-up models based on structure-conduct - performance paradigm could not be tested due to the non-availability of firm level data.

Another major limitation is the use of potential utilization ratio as a proxy for demand. It is argued that the ratio has been created to prevent competition which has nothing to do with demand condition.

SUGGESTIONS FOR FURTHER RESEARCH

(i) The use of potential utilization ratio as a proxy for demand needs a careful study at disaggregated level;

(ii) The theoretical models on mark-up based on structure-conduct-performance paradigm need information testing with firm level data;

(iii) The liberalisation effect on the industries should be examined by taking those industries which have benefitted from such policy measures; and,

(iv) The qualitative factors that affect the price formation in the industrial sector need a careful evaluation.

APPENDIX

SUGAR 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	65.4	51.1	52.9	54.4	38.9
1960	55.0	54.2	58.8	58.4	42.5
1961	62.1	61.4	58.9	59.3	43.8
1962	69.9	58.5	58.9	60.2	42.8
1963	78.9	57.5	60.5	62.6	33.8
1964	77.9	68.3	68.2	69.3	35.7
1965	77.7	70.4	68.2	69.0	43.6
1966	83.6	78.2	69.1	70.8	41.9
1967	110.8	84.6	83.3	88.4	27.1
1968	134.3	151.3	99.9	103.6	27.3
1969	99.9	115.8	100.3	100.2	47.3
1970	100.0	100.0	100.0	100.0	48.6
1971	125.3	107.5	100.9	103.7	39.6
1972	145.7		106.1	111.8	37.2
1973-74	162.2	149.4	118.0	123.0	39.1
1974-75	153.7	141.1	120.5	124.2	41.3
1975-76	209.3	186.6	126.0	135.5	39.8
1976-77	212.9	161.5	127.8	137.5	40.6
1977-78	222.1	175.4	127.7	138.4	38.0
1978-79	201.6	167.2	139.3	146.4	48.4
1979-80	288.4	206.9	216.8	225.0	35.3
1980-81	301.6	212.5	256.7	261.9	33.6
1981-82	295.6	258.3	195.3	206.7	38.6
1982-83	296.4	280.6	197.7	209.0	50.7
1983-84	409.2	332.9	208.0	231.0	42.3
1984-85	539.7	324.4	217.5	254.3	36.1
1985-86	353.0	242.8	237.6	250.8	47.3

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

General Note to the Appendix:

Since no ASI Census Sector data was available for the year 1972, transaction price for the same year has not been calculated for all the sample industries.

PAPER 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	56.2	61.7	56.5	55.5	84.8
1960	59.1	60.9	59.6	58.9	95.3
1961	58.2	61.2	62.8	60.4	95.2
1962	63.0	67.0	64.7	64.8	88.1
1963	65.7	68.3	66.3	67.8	91.6
1964	69.2	71.4	68.6	68.4	95.0
1965	74.3	74.8	72.5	72.4	84.8
1966	78.5	74.9	79.7	78.8	92.3
1967	88.6	76.3	84.9	84.3	92.5
1968	77.5	76.2	87.6	82.7	94.5
1969	92.3	89.3	95.2	93.9	95.4
1970	100.0	100.0	100.0	100.0	97.2
1971	109.8	108.8	104.2	105.7	91.8
1972	110.8		108.6	122.8	89.5
1973-74	158.8	114.4	127.3	140.7	89.7
1974-75	199.5	188.5	166.7	180.7	89.7
1975-76	161.2	175.6	172.6	167.7	90.4
1976-77	178.2	192.4	175.2	176.5	83.6
1977-78	201.6	201.9	194.1	197.3	86.2
1978-79	204.1	205.0	220.0	213.2	91.0
1979-80	244.1	265.2	261.3	254.0	89.3
1980-81	255.2	292.0	292.3	276.5	90.4
1981-82	267.2	314.5	350.5	314.9	90.3
1982-83	280.9	308.1	402.6	350.6	91.0
1983-84	350.9	437.4	447.5	406.2	85.6
1984-85	375.7	556.0	498.4	446.0	87.6
1985-86	325.6	474.5	469.2	407.9	92.8

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

TEXTILES 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	48.2	39.6	51.8	51.2	100.0
1960	50.5	45.0	57.8	55.3	98.9
1961	53.8	51.3	58.5	57.0	93.7
1962	58.8	53.9	57.0	58.2	96.3
1963	60.9	56.8	59.8	60.3	96.4
1964	64.8	59.9	63.3	62.9	93.6
1965	71.5	64.6	67.4	69.1	93.1
1966	78.0	72.3	74.4	75.9	88.3
1967	77.7	79.1	77.5	80.3	87.2
1968	85.9	81.3	84.2	84.8	91.2
1969	93.6	91.1	90.9	91.2	88.8
1970	100.0	100.0	100.0	100.0	89.7
1971	114.3	117.3	113.6	114.8	86.0
1972	139.1		101.5	110.1	92.8
1973-74	156.5	137.5	138.8	123.4	125.8
1974-75	177.4	151.8	170.6	173.3	90.8
1975-76	192.0	162.6	151.2	167.7	91.7
1976-77	184.6	172.8	196.2	191.7	92.5
1977-78	213.9	201.5	196.7	203.7	93.1
1978-79	218.4	214.1	181.3	196.3	92.8
1979-80	252.2	229.7	182.8	210.8	92.1
1980-81	261.2	232.3	202.6	226.3	93.6
1981-82	266.0	236.2	241.0	251.1	91.4
1982-83	325.5	210.7	225.0	265.6	84.8
1983-84	344.6	216.0	257.1	292.5	93.2
1984-85	387.5	254.3	320.5	347.6	91.8
1985-86	364.5	259.6	268.2	307.1	94.1

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

IRON&STEEL 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	53.7	55.4	52.9	52.4	82.3
1960	44.9	49.6	55.4	50.5	92.2
1961	39.6	45.0	57.0	48.9	92.9
1962	49.2	54.3	59.6	54.8	89.5
1963	45.9	57.3	60.8	53.8	95.6
1964	55.1	65.5	64.4	60.0	93.0
1965	59.9	66.5	73.9	67.4	91.7
1966	62.6	66.5	81.9	72.5	92.9
1967	72.4	73.9	86.1	81.2	83.7
1968	82.1	83.7	86.7	83.8	87.4
1969	80.4	82.6	91.2	86.1	90.1
1970	100.0	100.0	100.0	100.0	79.8
1971	111.0	113.5	102.0	109.9	77.1
1972	115.4		105.7	121.6	84.4
1973-74	180.8	156.2	131.4	154.5	79.8
1974-75	201.0	197.8	167.3	183.0	83.5
1975-76	192.2	200.0	185.5	188.6	82.9
1976-77	166.4	182.6	188.6	178.2	87.9
1977-78	188.4	195.8	194.3	191.5	86.4
1978-79	198.6	254.3	206.2	202.7	86.1
1979-80	248.1	323.0	235.7	241.5	82.3
1980-81	273.7	398.2	263.4	268.2	78.6
1981-82	291.1	489.1	348.8	321.8	85.1
1982-83	311.6	524.1	359.3	337.0	93.4
1983-84	396.1	573.2	345.7	369.2	83.6
1984-85	506.8	677.9	380.9	439.7	82.3
1985-86	397.7	682.2	400.8	399.4	81.5

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

CHEMICALS 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	40.2	37.5	56.9	54.0	95.5
1960	43.2	41.5	60.2	57.3	94.3
1961	45.7	46.1	62.1	59.1	94.0
1962	46.3	48.8	63.4	60.4	88.9
1963	49.2	51.1	66.3	63.2	88.1
1964	54.8	53.7	70.5	66.4	91.9
1965	62.7	62.9	76.7	74.5	89.9
1966	65.1	64.0	83.5	80.4	89.7
1967	72.1	75.3	87.4	85.6	95.4
1968	78.6	78.2	88.5	86.8	95.7
1969	88.0	88.7	93.1	92.2	94.5
1970	100.0	100.0	100.0	100.0	91.0
1971	104.3	109.6	106.9	106.6	88.5
1972	98.6		111.1	109.9	89.5
1973-74	112.5	104.9	144.0	138.6	89.4
1974-75	169.0	166.2	180.4	178.5	86.7
1975-76	159.6	176.6	182.7	178.8	84.7
1976-77	145.7	170.6	189.2	181.7	87.1
1977-78	151.7	177.1	196.5	188.8	91.6
1978-79	164.2	189.4	203.5	196.7	95.2
1979-80	192.6	226.3	235.7	228.3	94.0
1980-81	219.5	270.7	269.6	261.0	90.7
1981-82	221.0	298.3	309.1	294.0	89.4
1982-83	241.2	321.7	310.8	298.8	90.3
1983-84	298.9	383.0	341.6	334.3	87.5
1984-85	305.1	378.2	373.0	361.3	91.8
1985-86	334.6	433.2	402.1	390.5	92.1

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

GENERAL ENGINEERING 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	59.9	54.7	55.2	55.8	82.9
1960	58.5	61.7	57.3	55.2	88.5
1961	62.2	65.7	59.1	58.6	77.5
1962	65.2	64.8	62.1	60.0	82.9
1963	72.3	71.0	64.3	65.8	79.9
1964	75.2	76.9	66.8	67.4	83.7
1965	74.8	74.9	73.5	70.9	95.7
1966	90.0	88.1	78.6	81.1	74.0
1967	93.1	94.2	82.9	88.3	76.8
1968	95.8	88.4	85.4	87.1	82.3
1969	99.3	91.8	94.5	94.7	85.7
1970	100.0	100.0	100.0	100.0	79.9
1971	109.6	110.4	102.5	103.6	89.1
1972	119.3		107.5	117.1	81.9
1973-74	147.5	135.8	136.9	141.0	83.6
1974-75	168.0	170.4	171.8	170.3	89.2
1975-76	185.5	181.6	183.1	184.0	78.9
1976-77	176.7	186.3	187.8	183.5	77.2
1977-78	189.4	190.8	192.3	191.2	80.6
1978-79	179.7	208.0	209.7	198.0	84.8
1979-80	206.7	246.8	248.9	232.5	79.2
1980-81	216.3	267.5	269.7	249.0	80.5
1981-82	251.8	327.7	330.4	299.9	82.9
1982-83	282.2	362.8	365.8	333.4	73.7
1983-84	386.0	374.8	377.9	381.0	78.6
1984-85	421.5	409.7	413.1	416.3	83.5
1985-86	414.8	466.9	470.7	449.0	88.2

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

FERTILISERS AND PESTICIDES
1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	117.9	79.4	59.2	76.1	78.3
1960	107.3	77.2	61.6	74.7	89.1
1961	83.9	68.9	64.6	70.2	87.6
1962	74.9	71.0	66.9	69.2	78.6
1963	68.8	64.3	70.1	69.7	89.6
1964	73.8	66.1	72.8	73.1	80.9
1965	80.7	73.5	76.3	77.5	84.5
1966	125.1	106.5	83.4	95.4	86.2
1967	126.7	118.8	87.6	98.8	80.1
1968	115.6	115.0	89.3	96.9	79.5
1969	88.6	95.1	93.7	92.2	77.6
1970	100.0	100.0	100.0	100.0	84.3
1971	90.8	90.8	107.2	102.5	77.8
1972	90.9		110.9	105.1	82.3
1973-74	99.4	91.8	131.6	122.4	91.5
1974-75	136.1	171.7	177.4	165.5	83.6
1975-76	141.2	173.9	188.2	174.7	70.7
1976-77	115.2	164.8	193.3	170.8	81.7
1977-78	112.7	159.9	200.7	175.4	90.4
1978-79	116.5	170.1	214.4	186.2	90.6
1979-80	141.9	208.5	247.2	216.9	85.5
1980-81	158.4	248.8	280.5	245.4	78.9
1981-82	132.3	271.4	320.3	266.2	85.9
1982-83	129.5	289.4	330.4	272.6	89.1
1983-84	167.7	314.0	371.9	313.2	84.9
1984-85	145.8	289.0	395.0	323.3	88.2
1985-86	157.6	271.9	424.9	348.0	87.7

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

COTTON SPINNING 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	59.0	47.9	47.6	51.3	93.7
1960	62.0	54.9	51.4	54.8	91.0
1961	64.1	59.2	50.2	54.7	93.0
1962	69.6	61.3	52.2	57.8	93.8
1963	68.9	62.6	55.0	59.5	91.1
1964	71.1	64.9	57.9	62.2	91.1
1965	78.6	67.3	59.5	65.7	90.0
1966	83.2	71.9	62.9	69.4	87.3
1967	88.5	79.3	69.1	75.4	86.9
1968	87.8	81.1	75.8	79.7	92.4
1969	88.5	86.3	81.3	83.6	86.5
1970	100.0	100.0	100.0	100.0	86.0
1971	166.1	187.3	108.9	127.4	80.3
1972	146.4		92.0	109.6	87.1
1973-74	136.7	140.1	135.5	135.9	89.0
1974-75	181.5	178.4	168.1	172.4	91.4
1975-76	193.7	174.9	142.2	158.9	89.7
1976-77	177.6	196.7	194.8	189.2	92.2
1977-78	208.6	233.4	191.7	197.1	85.8
1978-79	200.1	233.3	172.8	181.6	91.1
1979-80	234.9	253.8	173.3	193.2	87.0
1980_81	231.0	251.2	194.1	206.0	93.6
1981-82	226.0	249.6	236.8	233.3	92.3
1982-83	264.5	283.7	214.3	230.5	89.7
1983-84	282.6	292.9	240.0	253.8	93.8
1984-85	279.7	294.6	276.9	277.8	95.5
1985-86	260.8	286.8	241.5	247.8	94.7

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

JUTE TEXTILES 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	37.0	38.9	47.1	43.2	94.7
1960	37.5	48.4	68.5	56.6	94.5
1961	39.8	60.7	78.9	63.8	82.1
1962	38.0	51.6	50.8	45.9	92.9
1963	40.6	51.8	53.3	48.4	94.6
1964	47.6	55.3	60.4	55.4	90.2
1965	50.9	66.1	80.1	68.9	93.7
1966	61.8	82.0	106.9	89.6	78.2
1967	62.9	80.0	85.2	76.6	81.1
1968	71.4	87.4	96.5	86.8	75.1
1969	91.5	104.7	109.8	102.8	60.6
1970	100.0	100.0	100.0	100.0	66.3
1971	113.7	116.7	96.2	103.0	73.7
1972	128.6		105.8	114.6	75.4
1973-74	161.5	125.6	101.6	124.6	54.6
1974-75	176.3	133.2	109.9	135.5	52.5
1975-76	176.4	136.9	123.5	143.8	61.7
1976-77	188.9	151.3	133.1	154.6	55.7
1977-78	213.7	167.6	153.7	176.8	58.3
1978-79	239.6	196.9	153.8	186.8	51.0
1979-80	242.4	220.2	149.8	185.5	67.7
1980_81	264.1	223.0	144.4	190.5	67.0
1981-82	257.6	194.7	155.8	195.0	64.2
1982-83	295.7	218.0	180.0	224.5	62.4
1983-84	340.7	273.6	250.7	285.3	50.9
1984-85	432.2	412.6	509.0	479.5	62.9
1985-86	379.4	388.5	291.9	325.6	61.9

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

HEAVY ELECTRICALS (GENERATORS & MOTORS)
1959-1985/1986

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	46.9	41.7	59.1	55.9	85.2
1960	42.7	47.7	61.7	56.6	88.8
1961	39.7	44.6	63.6	57.2	85.0
1962	63.5	54.2	67.2	66.2	77.2
1963	64.2	56.0	69.7	68.2	86.9
1964	62.7	60.1	71.8	69.4	78.2
1965	66.1	64.4	77.2	74.2	85.3
1966	76.4	76.5	82.8	81.1	89.3
1967	81.9	85.0	86.7	85.4	82.1
1968	100.1	106.8	88.1	91.3	75.9
1969	100.3	92.3	93.2	95.1	74.6
1970	100.0	100.0	100.0	100.0	81.9
1971	96.3	111.5	105.4	102.9	77.3
1972	122.7		109.8	113.2	83.2
1973-74	141.5	156.5	130.5	133.5	82.5
1974_75	158.6	174.4	169.5	166.6	77.0
1975-76	189.6	234.9	179.7	182.4	73.6
1976-77	181.1	248.8	180.9	181.0	62.9
1977-78	197.0	243.4	186.8	189.5	66.7
1978-79	161.9	215.6	200.0	189.8	76.7
1979-80	209.6	275.8	234.9	228.1	68.6
1980-81	237.0	324.9	254.9	250.1	64.0
1981-82	224.5	313.6	290.1	272.5	71.7
1982-83	303.4	419.8	315.8	312.5	65.4
1983-84	292.9	359.6	334.4	323.3	75.1
1984-85	358.6	419.9	359.1	359.0	79.1
1985-86	323.5	385.1	400.7	380.0	80.5

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

HEAVY VEHICLES (CARS,BUSES,JEEPS AND TRUCKS)
1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	32.5	38.9	58.4	32.5	69.3
1960	32.3	48.7	60.2	32.3	86.3
1961	36.0	54.7	61.8	36.0	83.1
1962	43.7	53.8	65.7	43.7	83.8
1963	53.3	66.0	67.9	53.3	70.3
1964	53.2	68.7	70.1	53.2	92.8
1965	63.0	77.7	75.0	63.0	92.0
1966	74.3	86.6	79.9	74.3	68.9
1967	90.8	91.2	84.9	90.8	66.7
1968	68.2	82.3	87.7	68.2	75.6
1969	89.2	94.5	94.9	89.2	73.5
1970	100.0	100.0	100.0	100.0	79.8
1971	110.3	115.1	103.8	110.3	85.1
1972	134.7		108.4	134.7	79.9
1973-74	144.2	129.8	132.4	144.2	84.0
1974-75	215.5	196.9	170.2	215.5	70.4
1975-76	233.4	223.2	180.3	233.4	68.2
1976-77	229.8	239.9	183.0	229.8	73.5
1977-78	246.6	235.1	189.6	246.6	72.5
1978-79	258.0	266.1	206.8	258.0	76.8
1979-80	289.0	312.1	248.8	289.0	78.8
1980-81	298.7	342.3	274.8	298.7	72.4
1981-82	310.2	375.2	321.6	310.2	79.8
1982-83	371.7	428.1	356.2	371.7	81.9
1983-84	665.0	420.9	379.5	665.0	81.1
1984-85	721.5	376.4	410.3	721.5	77.1
1985-86	566.1	370.2	459.8	566.1	81.8

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

BICYCLES AND MOTOR CYCLES
1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	53.3	42.3	58.3	57.1	79.3
1960	61.2	61.9	60.3	60.5	81.1
1961	61.0	63.1	61.7	61.5	87.4
1962	68.7	63.2	65.6	66.4	89.1
1963	75.7	71.9	68.0	69.9	84.5
1964	78.2	77.0	70.1	72.1	79.1
1965	82.3	78.6	75.1	76.9	88.6
1966	87.6	85.0	79.7	81.7	79.3
1967	91.6	89.0	84.7	86.4	75.1
1968	87.8	85.4	87.7	87.7	83.9
1969	71.3	77.2	94.9	89.0	85.1
1970	100.0	100.0	100.0	100.0	90.6
1971	96.9	100.6	103.9	102.1	58.8
1972	96.9		108.5	105.6	67.5
1973-74	96.5	101.5	133.2	124.0	76.6
1974-75	94.9	102.6	170.1	151.3	91.6
1975-76	86.9	94.5	180.3	157.0	85.4
1976-77	115.6	125.3	183.5	166.5	87.0
1977-78	119.5	129.1	190.3	172.6	84.3
1978-79	105.8	114.0	208.2	182.6	89.3
1979-80	138.9	162.9	251.2	223.1	76.6
1980-81	122.2	159.2	276.2	237.7	88.2
1981-82	157.9	207.9	324.3	282.7	88.1
1982-83	131.9	160.1	360.3	303.2	85.7
1983-84	207.6	262.3	384.2	340.0	90.0
1984-85	216.8	291.9	415.9	366.1	79.8
1985-86	187.9	260.8	467.0	397.2	88.7

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

TOBACCO 1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	109.3	56.5	64.6	73.5	83.8
1960	100.2	55.0	68.5	74.9	76.1
1961	96.6	56.1	65.7	71.8	81.2
1962	91.3	56.9	60.5	66.7	84.6
1963	88.8	66.5	67.3	71.6	82.4
1964	85.2	60.8	76.9	78.6	83.2
1965	76.3	68.4	83.1	81.7	87.4
1966	75.5	48.2	81.0	79.9	91.2
1967	90.8	95.4	82.0	83.8	84.9
1968	123.7	93.9	104.6	108.4	92.0
1969	106.9	113.6	124.0	120.6	86.9
1970	100.0	100.0	100.0	100.0	91.6
1971	124.7	132.2	96.4	102.0	85.1
1972	114.5		122.6	121.0	83.6
1973-74	99.1	72.7	137.0	129.4	81.6
1974-75	99.9	72.5	165.0	152.0	74.4
1975-76	140.3	116.6	166.0	160.9	71.9
1976-77	146.6	135.0	191.2	182.3	77.2
1977-78	148.6	105.1	149.0	148.9	79.3
1978-79	143.2	110.0	150.4	149.0	86.1
1979-80	150.1	88.8	161.4	159.1	88.7
1980-81	151.5	83.1	161.5	159.5	92.2
1981-82	168.6	86.9	159.8	161.5	92.2
1982-83	122.9	78.5	199.8	184.4	94.8
1983-84	605.5	296.9	245.4	317.2	88.1
1984-85	528.4	265.2	215.5	277.9	86.7
1985-86	835.2	343.9	222.4	344.7	77.1

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

DRUGS AND PHARMACEUTICALS
1959-1985/86

YEARS	LC	TP	RMC	PC	ACTIVITY
1959	26.9	36.4	58.8	52.7	77.7
1960	28.1	37.7	59.8	53.7	77.6
1961	28.5	38.6	63.6	56.9	87.8
1962	32.4	41.7	65.7	59.3	86.4
1963	34.4	47.3	66.7	60.5	73.5
1964	45.2	51.9	69.2	64.6	75.5
1965	55.0	62.7	73.7	70.1	74.6
1966	53.5	61.4	82.5	76.9	79.9
1967	74.1	78.7	88.1	85.4	69.6
1968	76.3	76.5	87.2	85.1	79.1
1969	90.4	91.4	93.6	93.0	80.3
1970	100.0	100.0	100.0	100.0	82.7
1971	104.7	112.5	103.7	103.9	92.4
1972	110.1		106.6	107.3	76.7
1973-74	109.0	106.2	124.5	121.5	71.4
1974-75	135.9	141.2	171.0	164.2	72.9
1975-76	158.8	171.9	174.3	171.3	72.0
1976-77	145.5	168.1	175.4	169.6	86.5
1977-78	172.2	184.9	179.3	177.9	85.2
1978-79	176.8	186.3	184.2	182.8	87.3
1979-80	220.4	234.8	209.3	211.5	82.5
1980-81	250.7	258.0	246.3	247.1	81.3
1981-82	283.7	295.5	271.9	274.2	86.9
1982-83	345.1	367.0	282.2	294.4	78.6
1983-84	449.6	483.8	297.5	326.8	79.0
1984-85	557.5	571.8	315.2	361.9	74.1
1985-86	579.8	599.9	331.0	378.9	71.4

NOTE: LC denotes labour cost; TP denotes transaction price; RMC denotes raw material cost; PC denotes prime cost.

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