'OLIGOPOLISTIC BEHAVIOUR IN THE INDIAN CEMENT INDUSTRY'

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DECLARATION

This is to certify that the thesis entitled "Oligopolistic Behaviour in the Indian Cement Industry" submitted by Geeta Ahuja in partial fulfilment for the degree of Master of Philosophy is original and has not been previously submitted, in part or full, for any degree in this or any other University. We recommend that this thesis should be placed before the examiners for their consideration for the award of a Master of Philosophy degree.

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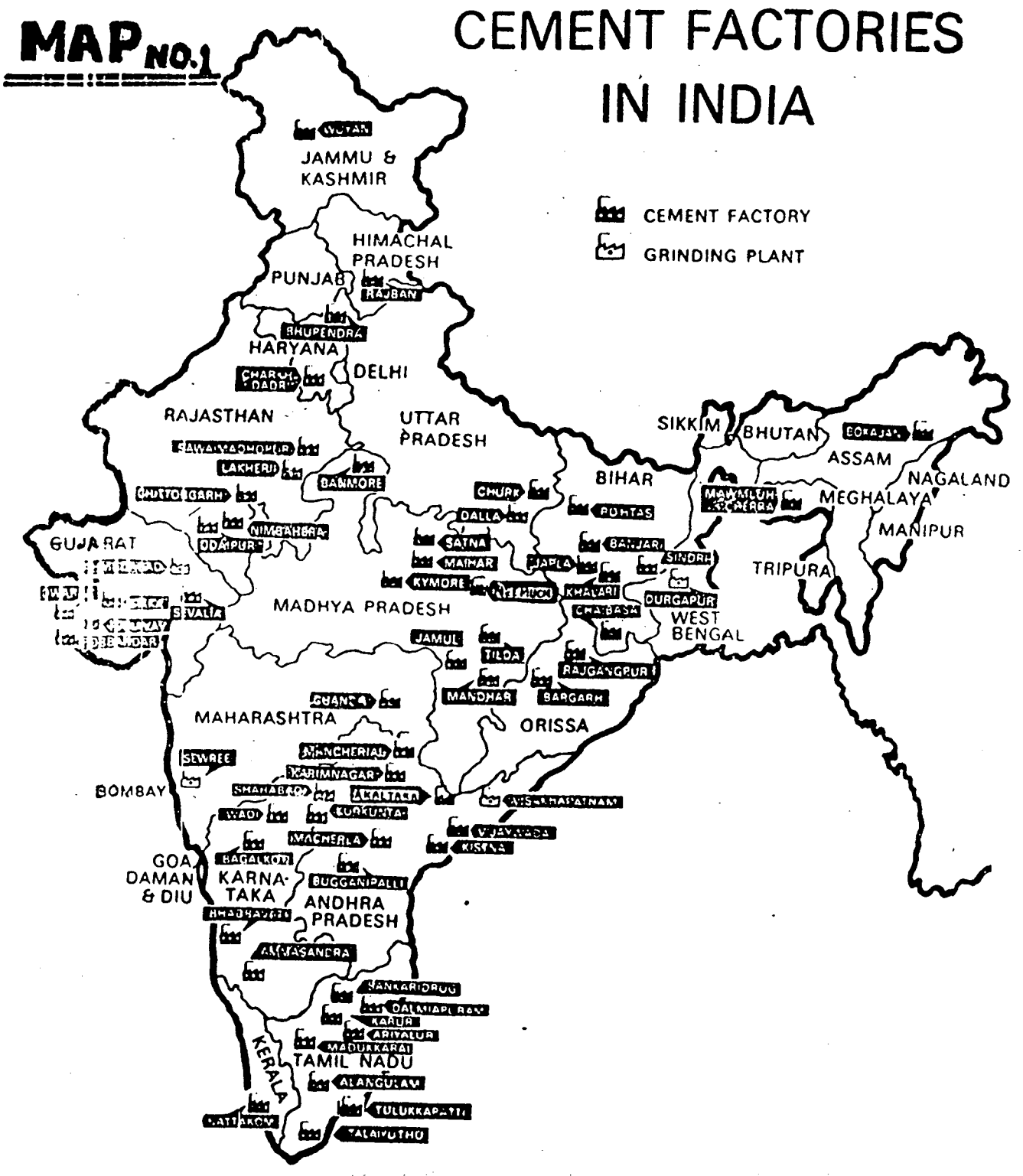
MAP NO.1
CEMENT FACTORIES IN INDIA
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INTRODUCTION

In any analysis of Indian industries, it would be most practical and useful to select an oligopolistic industry, since most of the industries in India are oligopolistic in nature. Also, it would be interesting to study oligopoly rather than any other market form, because the economic literature on oligopoly only gives us pointers to the behaviour of oligopolists. In practice, the behaviour of oligopolists does not always follow the pattern described in text books. This could be attributed to the fact that some of the predictions made by economic theory about the behaviour of oligopolists are based on certain assumptions (for instance, that prices are determined by the free forces of the market) which may not always hold true in the specific context.

This is precisely the reason why the Indian cement industry has been selected for the purpose of this study — because, here we have a very unusual combination of oligopoly and price controls. It would be very interesting to see if the other predictions of economic theory are still valid even if prices are regulated by the State.

In this study we find that the predictions of oligopoly theory regarding capacity utilization are still valid, in the sense that excess capacity has been used

by the leading firms as a method of entry deterrence as well as in an attempt to push up prices. But, other considerations have to be introduced - for instance, the fact that since the prices and distribution of cement were completely under government control until February 1982 and partially after that, the oligopolists chose the strategy of deliberately maintaining excess capacity in order to push up fixed costs, and thereby pressurize the government to adopt a policy that was more profitable to the cement industry. Also, deliberately maintaining excess capacity in a situation of excess demand and claiming that production could not be increased because prices were unprofitable, was a means of applying pressure on the government to increase cement prices.

We find that government intervention, instead of reducing the collusive power of the oligopolists, has, in fact, encouraged it further, and this is extremely undesirable in an industry which is supplying such an essential commodity.

The system of dual pricing adopted in February 1982 could have been very effective if a policy of partial decontrol had not adopted simultaneously. This is because, if a part of the output of an essential commodity which is already in short supply is allowed to be sold in the open

market, then, in an oligopolistic industry, there is always the danger that a tendency towards cartelization may arise, as did happen in the case of the Indian cement industry, where any attempt at decontrol simply led to the replacement of one price regulating agency (the government) by another- the Cement Allocation and Coordinating Organisation (CACO) in the 1968 decontrol, and the Cement Manufacturers' Association (CMA) in the 1982 partial decontrol.

It would have been much wiser for the government to adopt a policy of dual pricing whereby it would subsidise the more vulnerable sections of society of the priority sectors of the economy, while at the same time, providing a reasonable profit margin to the cement producers.

We also see that the policy of fixing prices on a 'cost-plus' basis encouraged inefficiency, for the cement producers had no incentive to make any attempt to lower costs, for that would have simply meant a lower retention price, and not necessarily higher returns to them.

The first chapter described some of the major conclusions of economic theory regarding oligopolistic pricing and investment behaviour. The subsequent chapters are concerned with the pattern of growth and government controls in the Indian cement industry, oligopolistic behaviour in

capacity creation and utilization, and the phenomenon of sickness. The final chapter summarises the conclusions of the study.

CHAPTER I

THE THEORY OF OLIGOPOLY AND ITS RELEVANCE TO THE INDIAN ECONOMY

Until the 1930s, economic theory generally presumed that serious market imperfections occurred almost solely in conditions of monopoly. However, an examination of actual markets, tended to show that domination of the market by a few large firms was a situation more likely to exist than that of ~~private~~ pure monopoly. Moreover, it was shown that domination by a few large sellers in less than perfectly competitive markets could lead to collusion — either tacit or open in the form of price-fixing, market sharing or other restrictive practices, because the presence of a few large firms allows and encourages them to act ~~interdependently~~ interdependently in making decisions regarding price, output and related matters.

High concentration in an industry may be a result of not only larger sized plants, reflecting significant economies of scale in production, but also of a larger number of plants under common ownership, arising from economies of scale in marketing.

Moreover, even when economies of scale have been exhausted, the larger firms may be able to preserve or even strengthen their position by erecting effective barriers to the entry of new firms.

~~A market consisting of a small number of powerful firms each of which is capable of actively influencing the~~

A market consisting of a small number of powerful firms each of which is capable of actively influencing the market situation by its own individual action, and a very large number of buyers each of whom makes only a negligible contribution to the market demand function, is characterized as an "oligopoly".

The main feature that distinguishes oligopoly from competition and monopoly is the fact that the oligopolists within an industry are strategically interdependent — the best policy for any firm is dependent on the policies being favoured by each rival firm in the market — and the firms are, moreover, conscious of their mutual interdependence.

Both competitors and monopolists have straightforward maximization problems to solve when seeking maximum profits i.e., equate marginal revenue to marginal cost, in contrast to an oligopolist, whose profit maximization problem is intertwined with those of several rivals.

The ability of oligopolistic firms to actively influence and change the market situation and the position of other firms in the market through their price and output policies, product differentiation, price discrimination and advertising behaviour, implies that price theory loses a great deal of the simplicity and determinateness which it possesses in dealing with perfectly competitive markets —

where a determinate solution is achieved by making the impersonal market forces the most powerful factor, and restricting the independent action of the firm to an adjustment to these forces - an adjustment which will be unique on the basis of profit maximization.

In order to be able to analyse and predict the price and output behaviour of oligopolistic firms, we would have to adopt a different kind of framework which is better equipped for dealing with moves and countermoves, with struggles for power and position, an analogy for which can be derived from books dealing with the general aspects of politics, and military strategy and tactics.[1]

It is only within such a framework (that is, one of game theory) that we will be able to tackle situations of economic warfare, aggressive price policies, non-price competition, etc. Several economists have pointed out the appropriateness of studying oligopoly within the framework of game theory.

For instance, Professor Pigou, in his "Economics of Welfare" referred to "the resemblance between the mutual bluff under oligopolistic conditions and a game of chess".[2]

Berle and Means also concluded that more could be learnt about the behaviour of the large corporations of a capitalist

1. K.W. Rothschild, "Price Theory and Oligopoly", (1947).
2. Ibid.

society "by studying the motives of an Alexander the Great, seeking new worlds to conquer, than by considering the motives of a petty tradesman of the days of Adam Smith".[3]

Again, E.G. Nourse has pointed out that an oligopolist "devises and implements business plans in ways broadly similar to those of military command."[4]

Profit maximization has been regarded as the sole motivating force behind the behaviour of entrepreneurs, by almost all economists. However, another equally important motive which should have been taken into account, but has generally been ignored, is the desire for secure profits.

The neglect of the security motive in the case of monopoly and competition (perfect and monopolistic) can be understood because, while for the absolute monopolist security against competitors is part of the definition itself, for the small competitor— for whom security of profits is an extremely important factor— the market conditions exert such an overwhelming influence that he cannot do anything to safeguard his position. All he can do is to try to maximise his profits (in the short run).

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3. Berle and Means, "The Modern Corporation and Private Property, p.350.

4. E.G. Nourse, "The Meaning of 'Price Policy'," The Quarterly Journal of Economics, February 1941, p.205.

However, the neglect of the security motive simply cannot be justified in the case of oligopoly and duopoly where firms not only have the desire but also the power to achieve a secure position, for the number of firms in the market is so small, and the size of each firm so large, that each firm can actively influence the market price and output by its individual action.

However, inspite of being aware of the security maximization motive, most economists have failed to take it into account explicitly in their formulation of oligopolistic price theory, and have relied exclusively on the profit maximization principle in their prediction of entrepreneurial behaviour. While this could be accepted in situations where the motives of maximum profits and maximum security both dictate identical patterns of behaviour (for instance, monopolistic agreements which, while aiming at increasing the stability of the industries concerned and the stability of market shares, ~~concerned~~, also enable these industries to increase their monopoly profits), it simply cannot be justified in cases where the two motives lead to conflicting patterns of behaviour.

For instance, while maximization of profits in the immediate future would require that prices respond to every change in revenue and cost conditions, security maximization may demand rigid prices; while profit maximization would tend

to create firms of optimum size, security maximization would tend to favour firms of larger than optimum size; while the profit maximization motive would dictate that reserve funds should be invested where they are expected to yield the highest returns, the security motive would require them to be unconditionally reinvested within the firm itself.

The desire to maximize security implies that, unlike competition, where even the most wildly fluctuating price is, at any moment, at a static equilibrium with respect to the prevailing supply and demand conditions, oligopolistic prices are determined by, and, therefore, should be interpreted in terms of, not only the factors that are simultaneously co-existing with them, but also the future changes which the price policy aims at.

The oligopolist has to quote a price that will allow him to hold his own vis-a-vis his rivals (both existing and potential) and his consumers. That means, in "normal" periods the price must be neither low enough to provoke a retaliation from the competitors, nor high enough to attract potential entrants. At the same time, it must be low enough to maintain the good will of his customers (i.e., maintain their loyalty) and high enough to cover his expected costs.

The base on which an oligopolist fixes his price is his expected costs. The margin of profit which he adds to the cost will depend on the strength of the oligopolist's

position. If his position is weak and barriers to the entry of new firms into the industry are low, then he may add only "normal" or "conventional" profits to costs in deciding the price, for fear of encouraging new entry.

However, if the position of the oligopolists is more powerful, and barriers to entry are relatively high, then they will add varying levels of "abnormal profit" in percentage terms, to their costs, in proportion to their assured strength, or they may even fix prices without any reference to costs altogether.

Since prices under oligopoly are decided after a great deal of careful planning by the oligopolists and are not simply the mechanical result of impersonal market forces, there is a tendency for the price to be more or less rigidly maintained, and adjustments to changes in "external circumstances", particularly in demand and costs, or for defensive/offensive action against rival firms can, to some extent, be made through changes in the quality of the product, credit and discount arrangements, salesmanship etc.

Violent fluctuations in the price would occur only either when there are changes in the "terrain", i.e. when costs, demand or other conditions facing the industry change so much that even after full use has been made of non-price weapons such as discounts, credit, product quality, etc. the habitual price policy becomes untenable, or where some

of the oligopolists attempt to improve their position at the expense of their rivals.

Changes in terrain may be unfavourable or favourable. For instance, there may be such a sharp increase in costs or decline in demand that the firms would have no alternative but to revise the price, upwards or downwards in each case respectively. This may, at times, lead to a price war between rival firms if some of them feel confident enough to participate in such a trial of strength. For instance, if an upward price revision by one or a few firms is not followed by rival firms, or if a decline in price is followed by even larger price cuts by rival firms.

More frequently, however, the oligopolists prefer to avoid such a showdown and the new set of more appropriate prices is often arrived at through either tacit or open agreements. This is particularly so in times of depression.

On the other hand, there may be an improvement in the environment, when new avenues for investment open up, offering room for expansion of the industry as a whole. For instance, when technical progress offers scope for a decline in costs and/or when by a significant reduction in price the market can be extended to include a large number of new, previously untouched customers.

This typically happens in new and expanding industries producing luxuries and semi-luxuries (e.g., videos, computers etc.) after the first stage of technical and sales pioneering

has been passed. Here, the incentive to lower prices in order to maximize profits would not be thwarted by the fear of instigating a price war, because here it is not a question of invading a rival's territory or cutting into a rival firm's market share, but one of entering new, unoccupied territory before others have taken possession of it.

Finally, a policy of price stability may be followed by an aggressive price policy if some of the oligopolists endeavour to grab a portion of their rivals' share of the market. Such instances do take place from time to time.

In order to be able to survive a period of price war, a firm must be in a very powerful position, with a great deal of financial resources. Thus, size would be desired for its own sake, independent of technical considerations, i.e., once the security motive is taken into account, the "optimum size" of the firm-from the entrepreneur's point of view — would usually be larger than that dictated by the profit maximization motive alone. This also accounts for the fact that profits may be reinvested within the firm even in the event of higher yields being obtainable elsewhere.

Again, it is the fear of their customers being enticed away by rival firms, as well as their desire to promote sales, of course, which manifests itself in the

form of the massive advertising expenditure being incurred by oligopolists.

Oligopolists have not only to insure themselves against shortage of raw material and finance during ordinary times, but, even more so, against the pressure which the suppliers of raw materials and finance may exert on them to take advantage of their vulnerable position during a price war.

The larger oligopolists often attempt to safeguard themselves against this danger either by vertical integration or, at least, by interlocking directorates and share holdings.

Thus, to put it briefly, it is basically the fear of an impending price war, or alternatively, the conscious or sub-conscious desire to provoke one, that motivates oligopolistic firms to follow a pattern of behaviour which cannot be interpreted in terms of profit maximization alone.

Unlike perfect competition and monopolistic competition where new firms can freely enter the industry, certain factors make entry extremely difficult in the case of oligopolies and monopolies. The barriers to the entry of new firms into the industry may be either due to the inherent nature of the industry itself, for instance, when economies of scale are very significant. In this case, a new entrant would suffer a cost disadvantage if it entered the industry on a small scale. On the other hand, if it

enters on a large scale, it would incur the risk of a massive loss if it is not able to capture a sufficient share of the market.

In addition, large-scale entry may cause prices to fall by creating an excess supply of the product at the ruling market price. This would be particularly the case if the minimal optimal scale of production is a significant proportion of market demand and/or if the elasticity of demand is low.[5]

Economies of scale may be either "real" (those which reduce the inputs of factors per unit of output) or "pecuniary" (those which result from paying a lower price for the inputs purchased by the firm).

Real economies may be either technical (resulting from using more efficient large-scale machinery), managerial (resulting from spreading the managerial fixed input over a larger amount of output) or labour economies (arising from greater specialisation of labour).

Pecuniary economies may arise when firms can buy their inputs in bulk at preferential prices; or when larger levels of output lead to lower transport cost per unit, or due to lower advertising and selling costs per unit of output as the scale of production is increased.

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5. Hay and Morris, "Industrial Economics", p.184.

Whenever economies of scale are present in any form, they do impose an important barrier to the entry of new firms.[6]

The initial amount of capital outlay required to set up a business depends on the technology of the industry into which entry is being considered, and often acts as a barrier to entry, particularly if the initial amount of capital required is very large.

Firms already established in the industry may possess an absolute cost advantage over potential entrants due to (a) knowledge of superior production techniques acquired as a result of past experience, or due to the possession of patent rights over the techniques; (b) control over particular inputs which are required for production,-for instance, raw materials, trained managerial personnel, skilled labour, certain types of equipments, etc.; (c) they may have easier access to funds as compared to a completely new firm, because of access to internal financing, and also because they may be able to secure loans from the capital market at relatively lower rates of interest. (d) The established firms may be able to operate at lower costs due to vertical integration of the production process. If an entrant wants to achieve the same advantageous cost structure, he may have

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6. J.S. Bain, "Barriers to New Competition" (1956).

to enter the industry with a fully integrated productive unit, whose absolute capital requirement of setting up may be so high as to create an absolute barrier to entry, instead of merely an absolute cost disadvantage (for the entrant).

If an entrant faces any kind of an absolute cost disadvantage, its long run average cost curve will lie completely above that of the established firms, at any level of output (see diagram).

Therefore, the established firms can prevent the potential entrant from entering the industry by setting their price at a level just below the cost of the new entrant.

As far as the absolute cost advantage is concerned, it may be pointed out that this would be a significant barrier to entry only if the potential entrant is an absolutely new firm. For, if the entrant is already established in some other industry, it would already have its own trained managerial team, some amount of technical know-how, its own source of supply of raw materials, labour etc., easy access to finances (both internal and external sources), and may even already be vertically integrated, to some extent at least.

At the same time, it may be pointed out that if the entrant is a completely new firm it would have a definite advantage over existing firms in that it can plan its plant de novo (from scratch) and adopt the most up-to-date methods of production, while the older, established firms are bound to possess some amount of old machinery which can only be scrapped completely in the long run. Moreover, a new firm would be absolutely free to choose the location of its plant and its distribution channels, a choice which is certainly not open to the already established firms (at least in the ~~long~~ short run).

These factors may significantly reduce the cost advantage enjoyed by the established firms and may, at times, even eliminate it altogether.

The most important barrier to entry is that of product differentiation, because, buyers develop preferences for particular existing brands of the good in question, (particularly, consumer goods) and in order to attract some of the customary buyers of older, established firms, a newcomer would have to either offer its product at a substantially lower price than the other firms, or undertake a massive advertising campaign, or both, leading to higher selling costs.

However, if the new firm is innovative enough, the very existence of product differentiation can act as an

encouragement to entry.

In addition to the above four barriers to entry discussed by J.S. Bain in his "Barriers to New Competition" (1956), we could add the legal barriers to entry which are imposed by law. Such barriers, if they exist, can completely block entry, and the firms within the industry may charge any price they like, without any fear of attracting new entrants.

Turning now to the question of the investment behaviour of firms, in the 1930s Kalecki and Keynes both put forward theories, independently of each other, that emphasized effective demand and financial conditions as the primary determinant of the investment decisions of firms, in contrast to the neo classical theory which modelled investment as merely the "adjustment of a capital aggregate to an optimal level, assuming profit maximization, perfect competition, and well behaved neo-classical production functions."[7]

According to both Kalecki and Keynes, a firm's decision regarding an expansion of its capacity is governed by the firm's demand expectations relative to its existing capacity, and on its ability to generate investment funds

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7. S.M. Fazzari and T.L. Mott, "The Investment Theories of Kalecki and Keynes: An Empirical Study of Firm Data, 1970-1982;" Journal of Post Keynesian Economics, Vol.IX No.2, Winter 1986-87.

from internal sources as well as external debt financing and on the prices of investment goods.

One important determinant of the volume of net investment undertaken by a firm is the current level of capacity utilization. Since maintenance of excess capacity in relation to demand involves a cost and reduces its profits, a firm's investment plans must be closely linked to the level of projected demand relative to its current capacity. And, the level of capacity utilization at any point of time can (assuming there are no supply side constraints) give us some idea of the level of demand.

While the projected level of demand along with technical considerations such as economies of scale determines how much investment a firm would _like_ to undertake, its ability to mobilise funds (from internal and external sources) sets definite limits to the amount of gross and net investment which a firm _can_ undertake.

In India, some of the conclusions/predictions regarding the behaviour of oligopolists arrived at by economic theory may have to be modified because in this country, as in South Korea and Japan, oligopolistic units usually occur in the form of only a part of a larger business house spread across several industries, for instance, the Tatas, Birlas, Escorts, etc. Therefore, _within_ a particular industry, it

may so happen that neither the motive of profit maximization nor that of maximum security may be fulfilled. The following chapters are concerned with examining to what extent oligopolistic behaviour in the Indian cement industry corresponds to the pattern described above.

CHAPTER - 2

HISTORY OF THE INDIAN CEMENT INDUSTRY.

The Indian cement industry has been characterised by an oligopolistic/quasi monopolistic market structure since its inception in 1914, and by underutilization of capacity almost throughout. The oligopolistic structure of the industry enabled the producers to enter into a coalition to manipulate prices whenever the price tended to fall too low, particularly before 1942, when the government had not yet taken over control of the price and distribution of cement, between January 1966 and January 1968, when cement was briefly decontrolled, and once again, when the policy of partial decontrol was adopted towards the end of February 1982.

The manufacture of Portland cement in India commenced in Madras in 1904 by South India Industrial Ltd., which had a capacity of just 10,000 tonnes per year. However, this enterprise failed, and it had become practically defunct a few years after the end of world war I.

The real "foundation stone " of the present cement industry was laid by the establishment of a factory at Porbander in Gujarat by the India Cement Company Ltd., in 1912. Another cement company was set up later during the year in Madhya Pradesh, and a third one was established in Rajasthan during the following year. The total manufacturing capacity of the last three plants, as originally equipped, was 75,000 metric tonnes per year.

TABLE 2.1

	Name of the Company	Date of establishment	Date when commenced manufacturing	Site of works	State (present)
1.	South India Industrial Ltd.	1879	March, 1904	Washermanpet	Madras
2.	India Cement Co. Ltd.	1912	October, 1914	Porbander	Gujarat
3.	Katni Cement & Industrial Co. Ltd.	1912	January, 1915	Katni	Madhya Pradesh
4.	Bundi Portland Cement Ltd.	1913	December, 1916	Lakheri	Rajasthan

SOURCE: Indian Tariff Board: "Report on Cement" (Calcutta, 1925).

TABLE 2.2

Domestic production of Cement, 1914-20, (in metric tonnes).

Name of the Company	1914	1915	1916	1917	1918	1919	1920
1. South India Industrial Ltd.	-	N o t		A v a i l a b l e		-	5,010
2. India Cement Co. Ltd.	947	4,991	7,526	14,267	18,044	19,768	16,482
3. Katni Cement & Industrial Co. Ltd.	-	13,208	31,767	41,156	37,318	35,168	34,306
4. Bundi Portland Cement Ltd.	-	-	-	14,488	30,332	33,269	36,920
TOTAL	947	18,199	39,293	74,911	85,694	88,205	92,718

SOURCE: Indian Tariff Board: "Report on Cement"(Calcutta, 1925).

At the time these factories were established, there was a strong preference for British cement on the part of users in India. But the decline in imports due to the first world war, particularly during the years 1916 to 1919, gave a tremendous fillip to the industry, and it was able to produce even more than its rated capacity.

The government had taken over control of the output of cement during the War (ie, World War I). But these controls were lifted immediately after the War, and a period of boom began for the cement industry, as a consequence of which the existing three plants expanded their capacities and six new plants were set up between 1919 and 1922, all of which had begun production by 1924. (See Table 2.3).

Unfortunately, however, these factories were set up in a very unplanned manner. For instance, out of the nine factories in existence by 1920, four were located within Madhva Pradesh itself! This led to a great degree of internal competition among the factories, and, consequently, the price of cement fell from above Rs. 70 per tonne in 1922 to Rs. 25 per tonne in some cases, in January 1925.[1]

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1. Indian Tariff Board; " Report on Gement", (Calcutta, 1925), page-11.

TABLE 2.3

	Name of the Company	Year of establishment	Date of commencement of manufacture	Location		Annual capacity (metric tonnes)
				Place	State (present)	
1.	Dwarka Cement Co. Ltd.	1919	January, 1922	Dwarka	Gujarat	101,600
2.	Sone Valley Portland Cement Co. Ltd.	1922	October, 1922	Japla	Bihar	50,800
3.	Jubbalpore Portland Cement Co. Ltd.	1920	December, 1922	Jukehi	Madhya Pradesh	60,960
4.	Gwalior Cement Co. Ltd.	1919	April, 1923	Banmore	-do-	40,640
5.	Punjab Portland Cement Ltd.	1920	July, 1923	Wah	W. Punjab (Pakistan)	36,580
6.	Central Provinces Portland Cement Co. Ltd.	1919	October, 1923	Kymore	Madhya Pradesh	101,600

Source: "Cement Industry in India" by V. Poddar, 1962.

TABLE 2.4

Production, Imports & Consumption of Cement in India, 1914-38

(in tonnes)

Year	Indian production	Total imports (pvt. & Govt.)	Total Indian consumption
1914	945	165,723	166,668
1915	17,912	142,469	160,381
1916	38,672	97,543	136,215
1917	73,728	85,594	159,322
1918	84,344	27,177	111,521
1919	86,812	92,787	175,599
1920	91,253	138,698	229,951
1921	132,812	129,813	262,625
1922	151,336	136,920	288,256
1923	234,936	124,822	359,758
1924	263,746	117,950	381,696
1925	360,549	134,292	494,841
1926	388,000	106,916	495,000
1927	478,000	121,299	599,000
1928	588,000	137,428	695,000
1929	561,000	129,878	691,000
1930	563,929		
1930-31	570,000	120,575	691,000
1931-32	583,000	91,744	675,000
1932-33	592,531	85,485	678,016
1933-34	642,944	65,915	708,859
1934-35	780,794	69,111	849,905
1935-36	890,683	58,796	949,479
1936-37	997,414	52,164	1,049,578
1937-38	1,169,894	31,916	1,201,810

Sources: Figures for production upto 1924 are derived from the Indian Tariff Board: "Report on Cement" (Calcutta, 1925); from 1926-1931-32 from Sastry, "Statistical Study of India's Industrial Development" and for 1925 & 1930 from "The History of the Cement Industry in India" published by ACC in 1937.

Figures of imports upto 1923-24 are derived from Indian Tariff Board: "Report on Cement" (Calcutta, 1925), and later figures are derived from CISD: "Annual Statements of Seaborne Trade" published annually by the Govt. of India.

All other figures are from Govt. of India, CISD: "Statistical Abstracts for British India" for the relevant years (annual reports).

TABLE 2.5

Output of Cement

(in metric tonnes)

Name of the Company	1921	1922	1923	1924
1. South India Industrial Ltd.	4,049	2,763	-	2,830
2. India Cement Co. Ltd.	26,162	21,601	15,031	11,159
3. Katni Cement & Industrial Co. Ltd.	43,665	44,521	54,127	37,714
4. Bundi Portland Cement Ltd.	61,062	56,111	57,968	55,478
5. Dwarka Cement Co. Ltd.	-	28,761	25,829	12,192
6. Sone Valley Portland Cement Co. Ltd.	-	-	23,368	42,062
7. Jubbalpore Cement Co.Ltd.	-	-	21,221	29,543
8. Gwalior Cement Co. Ltd.	-	-	18,776	10,104
9. Punjab Portland Cement Ltd.	-	-	15,240	32,106
10. C.P.Portland Cement Co.Ltd.	-	-	7,112	34,777
TOTAL	134,938	153,757	238,672	267,965

Source: **Indian Tariff Board: "Report on Cement" (Calcutta, 1925).**

As a result of the internal competition, the price of cement continued to fall even after 1925, and, as a consequence, three of the companies went into liquidation.

It seems that the amount of capacity installed in the cement industry was really excessively high because, even though total consumption increased rapidly after the first World War, (it trebled between 1920 and 1929), and imports declined almost continuously after 1928, the Indian cement industry worked with high degrees of excess capacity almost throughout the pre Independence period.

By 1925-26, the cement companies had realised the need for mutual co-operation to put an end to the internal competition and price cutting. Hence, a series of quasi-monopolistic organisations were set up - the Indian Cement Manufacturers' Association in 1926, the Concrete Association of India in 1927, and the Cement Marketing Company of India Ltd., in 1930.

The Cement Marketing Company of India (CMC) was formed in order to economise on the marketing and distributing expenses of cement, and to propagate the use of cement amongst the general public.

It was responsible for the sale of almost all the companies (it fixed a quota for each factory) and did succeed in stablizing the price of cement. However, the fixed quotas made for an inefficient use of existing capacity, and led to unnecessary increases in transport costs.

TABLE 2.6

Capacity and output of Cement Industry

(tonnes)

Year	Capacity	Production
1924	561,000 tonnes	264,000 tonnes
1934	1,089,000 "	741,025 "
1936-37	1,465,000 "	1,000,000 (approx.) "
1940	2.5 million tonnes	1.5 million tonnes

Source: 1934 - "Cement Industry in India" by V. Podder, 1962.

1924,1940 figures - "Private Investment in India, 1900-39" by Amiya Bagchi.

1936-37 figures: M.C. Munshi - "Industrial Profits in India(1936-44)"; New Delhi(1948).

TABLE 2.7

Capacity installed and output of cement, 1943-1949.

(in lakh tonnes)

Year	Installed capacity	Total production
1943	25.55	21.16
1944	26.15	20.84
1945	26.15	21.63
1946	26.15	20.10
1947	27.15* 21.15+	17.38
1948	21.15	15.53
1949	28.15	21.00**

* upto 15th Aug, 1947

+ From 15th Aug, 1947

** Estimated.

Source: "The Cement Industry in India" by Jaidayal Dalmia published by the CMA in 1964 COMMECRCE, (11th Feb, 1950).

Hence, under the leadership of Mr. F.E. Dinshaw, all the cement manufacturers, with the exception of one (the Sone Valley Portland Cement Company, Ltd., Japla, with a capacity of one and a half lakh tonnes annual production) agreed to merge together into one company, and the Associated Cement Companies, Ltd. (ACC) was established in 1936.

However, this company soon faced a challenge to its monopolistic position from a business group in eastern India — the Dalmia - Jain group. As the Dalmia-Jain group of factories began production in May 1938, the price of cement dropped sharply from Rs. 43 per tonne in May to Rs. 30 per tonne in October 1938. Consequently, ACC's net profits fell from Rs. 7,630,000 in the year ended 31st July 1938 to Rs. 3,178,000 in the next year.

TABLE 2.8

Year	Net profits of ACC
1937-38	Rs. 7,630,000
1938-39	Rs. 3,178,000
1939-40	Rs. 3,606,000

Source: **Cement Manufacturers' Association.**

Eventually, ACC and the Dalmia Cement Company agreed to set up a joint selling organisation which would fix prices and divide total sales between the two concerns on a mutually agreed basis.

By 1947, 23 cement companies were in operation, out of which five went to Pakistan during the Partition.

In the post Independence period, demand for cement increased rapidly, especially since the advent of Planning, because of the massive construction work undertaken to implement the new development projects and also to repair and renovate buildings, roads and bridges, etc. destroyed during the Independence struggle. Also, imports of British cement were no longer encouraged by the government.

As a result, capacity increased from 2.2 million tonnes in 1947 to 9.0 million tonnes in 1961. The rate of capacity utilization also increased greatly.

By and large, cement producing units have been concentrated around areas of limestone deposits, while demand was spread throughout the country. In addition, persistent shortages of cement in relation to demand led to "black marketing". In order to ensure an equitable distribution of the available supplies of cement at a uniform price throughout the country, the government, therefore, began exercising control over its price and distribution.

TABLE 2.9

Degree of capacity utilization in cement industry.

Year	Capacity (lakh tonnes)	Production (lakh tonnes)	Capacity utilization (%)
1944	20.76	16.88	81.31
1945	20.76	16.94	81.60
1946	21.17	15.67	74.02
1947	22.17	14.75	66.53
1948	23.85	15.78	66.16
1949	30.38	21.39	70.41
1950	30.38	28.61	94.17
1951	34.73	32.22	92.77
1952	37.42	35.73	95.49
1953	43.29	38.34	88.57
1954	46.66	44.50	95.37
1955	48.68	45.71	93.90
1956	59.93	50.22	83.80
1957	64.84	56.91	87.77
1958	72.67	62.30	85.73
1959	83.39	69.18	82.96
1960	89.66	78.01	87.01
1961	89.66	83.24	92.84
1962	92.52	86.79	93.81
1963	95.05	91.66	96.43
1964	104.25	97.24	93.28

cont....

TABLE 2.9 (Contd.)

Year	Capacity	Production	Capacity utilization (%)
	(lakh tonnes)		
1965	110.40	105.78	95.82
1966	116.91	110.58	94.59
1967	122.77	113.02	92.06
1968	138.64	119.42	86.14
1969	153.33	136.30	88.89
1970	167.58	139.66	83.34
1971	182.85	149.76	81.90
1972	190.05	157.88	83.07
1973	192.13	149.99	78.07
1974	194.52	143.40	73.72
1975	206.28	163.52	79.27
1976	206.70	187.07	90.50
1977	212.31	191.73	90.31
1978	216.75	196.22	90.53
1979	223.61	183.38	82.01
1980	243.53	178.94	73.48
1981	257.59	208.74	81.04
1982	290.31	226.37	77.98
1983	336.39	256.98	76.39
1984	376.22	296.72	78.87
1985	391.45	317.49	81.06

Source: Data collected by CMA.

(Appendix to Chapter 2)

Market Share of Firms in the Total Production (1971-80)

(in %)

1	1971 2	1972 3	1973 4	1974 5	1975 6	1976 7	1977 8	1978 9	1979 10	1980 11
1. A.C.C.	35.742	34.375	36.367	36.994	36.049	34.033	33.990	32.571	32.114	30.635
2. India Cement	8.568	9.050	6.995	7.240	7.245	7.746	6.856	7.756	7.166	6.149
3. Birla	5.401	6.549	6.265	7.163	7.073	7.419	7.202	6.821	7.621	6.700
4. Digvijay	5.320	4.779	4.792	4.941	4.750	4.673	4.686	4.983	5.197	5.042
5. Jaipur	4.763	4.378	4.531	3.308	1.800	1.891	3.852	3.508	3.185	2.529
6. D. Bharat	3.435	4.156	2.925	2.992	3.023	3.132	3.014	2.724	2.818	2.675
7. U.P.	2.858	4.226	4.391	3.343	3.970	3.760	3.050	3.226	2.703	2.720
8. Saurastra	2.791	2.914	2.844	3.518	3.232	2.895	2.542	2.535	2.143	2.360
9. Mysore	2.784	2.380	2.577	2.313	2.599	2.159	1.881	2.227	2.160	2.203
10. Orissa	2.670	2.902	2.516	2.642	2.673	2.363	2.489	2.468	2.494	2.310
11. Panyam	2.516	2.399	2.034	2.053	2.157	2.406	2.044	1.889	1.074	1.573
12. Rohtas	2.187	1.813	1.773	1.254	0.848	1.461	1.106	1.377	1.200	1.169
13. Kesoram	1.979	2.316	1.827	1.794	2.513	2.718	2.710	2.842	3.903	4.002
14. T.N.	1.845	2.068	1.727	1.626	1.345	1.858	1.567	1.812	1.677	2.939
15. I.D.C.	1.764	2.113	2.275	2.165	2.335	2.046	2.222	2.135	2.171	2.248
16. Kanpur	1.670	1.603	1.780	1.913	1.806	1.509	1.415	1.567	1.387	1.641
17. Chettinand	1.617	1.183	1.091	1.682	1.659	1.874	1.944	1.987	2.017	1.922
18. K.C.P.	1.549	1.457	1.211	1.380	.934	1.235	1.499	1.490	1.557	1.259
19. Andhra	1.382	1.081	1.231	1.331	1.395	1.482	1.530	1.418	1.540	2.130
20. Bajalkot	1.355	1.680	1.566	1.408	1.413	1.133	0.859	.942	.866	0.770
21. Dalmia D.	1.321	1.120	1.305	.890	.811	0.123	0.859	.860	.619	0.050
22. Ashoka	1.274	1.355	1.218	.749	.676	0.913	0.833	.204	—	—
23. C.C.I.	1.221	1.304	1.834	1.766	1.966	1.944	2.369	2.314	3.267	4.446
24. Hindustan	1.221	1.419	.950	1.345	1.302	1.181	1.153	1.177	1.288	0.893
25. Madras	1.154	.941	.910	1.135	.952	1.069	1.520	1.643	1.946	2.417
26. Bhadrabati	0.610	.610	.649	.728	.571	.537	.482	.486	.498	0.421
27. Cherra	0.496	.305	.421	.497	.399	.322	.272	.317	.307	0.342
[illegible]	[illegible]	.655	1.800	1.780	1.573	1.047	.487	1.101	.822	1.611
29. Travancore	0.268	.197	.180	.035	—	—	—	—	—	—
30. J.K.	—	—	—	—	1.493	1.998	1.876	2.140	2.396	3.153
31. Century	—	—	—	—	1.431	3.056	3.669	3.467	3.849	4.080
32. Maihar	—	—	—	—	—	—	—	—	—	0.196
Total :	100	100	100	100	100	100	100	100	100	100

CHAPTER 3

PRICE CONTROLS AND PRICE BEHAVIOUR

Price controls in India had their genesis in the shortages of the second world war. They were introduced as a temporary measure, mainly to help the war effort through the procurement of wheat and other essential items required for the armed forces, at controlled prices. They had to be continued as immediately after the war we had extreme shortages of foodgrains and various other essential items.

Later, price and distribution controls became necessary to step up the rate of investment and to pursue the path of development initiated in the Second Five Year Plan, because the output of essential consumer goods was not likely to increase pari passu with the growth of income arising from the step-up in the output of investment goods.

Although we today still continue to have controls over industrial licensing, imports, and prices and distribution, the controls are much less rigorous now. Rigid control over prices with a view to making essential products available to consumers at reasonable prices, is now exercised over just a few commodities. In fact, for most

agricultural products, price control has now taken on the character of price support policies.

Prices of cement have been controlled since 1942 except during 1966-67, when it was decontrolled briefly. Under the system of price controls, the retention price (payable to the manufacturer) and a uniform freight-on-rail (f.o.r.) price are fixed by the government.

Regarding the f.o.r. price, by equalizing railway freight charges on the movement of cement, the f.o.r. price was kept at the same level at all destinations. But, until 1974, no such equalization was undertaken in respect of the procurement of raw materials. Consequently, production costs of cement varied from unit to unit, depending on the nearness of the plant to the source of raw materials, though the price payable for the product was the same for all units.

The difference in power tariffs in various states, and in some cases even within the states,[1] and differences in the rate of the mineral rights tax levied on limestone (whose burden varied from 45 paise to Rs. 20.25 per tonne of cement in 1978) further intensified cost differences amongst cement plants. A study conducted by the NCAER[2] found that the cost of limestone varied from Rs. 4.50 to Rs. 31.80 per tonne of cement in 1969-70, and from Rs. 8.90 to Rs. 74.80 per tonne of cement in 1975-76. (See Tables 3.3 and 3.4).

1. See Table 3.1.
2. NCAER, (1978).

Table 3·1

Unitwise Power Rates in Different States

State	*Unit*	*Power rate in paise per KWh*	
		1975-76	*1969-70*
Andhra	1.	21.60	7.30
	2.	19.90	7.30
	3.		
	4.	21.50	7.00
	5.	19.70	6.60
	6.	18.20	9.40
Bihar	7.	16.40	7.10
	8.	24.30	10.20
	9.	21·80	8.50
	10.	23.00	9.50
	11.	23.20	9.60
	12.	21.20	12.10
	13.	11.10	10.70
Gujarat	14.	26.20	10.10
	15.	26.40	12.40
	16.	20.00	8.50
	17.	22.10	11.60
	18.	23.60	11.90
Haryana	19.	16.80	7.90
	20.	31.20	9.00
Karnataka	21.	13.50	6.40
	22.	13.70	6.40
	23.	11.00	6.00
	24.	10.00	6.10
Madhya Pradesh	25.	23.70	14.30
	26.	17.30	9.20
	27.	16.70	8.80
	28.	20.00	12.00
	29.	21.60	N.A.
Orissa	30.	19.20	N.A.

Table 3.1 (contd)

State	Unit	Power rate in paise per KWh	
		1975-76	1969-70
Maharashtra	31.	17.00	18.80
	32.	25.20	10.10
Rajasthan	33.	16.10	19.90
	34.	27.30	12.40
Tamil Nadu	35.	19.80	7.80
	36.	19.20	*
	37.	19.70	6.70
	38.	19.70	6.70
	39.	19.70	6.70
	40.	17.80	N.A.
WEIGHTED AVERAGE		20.50	8.80

* Not in production.

N.A. = Data not available.

SOURCE:— Data collected by the NCAER.

Table 3.2

Distance Between the Limestone Sources and Cement Plants

	Zones				*Total*
	North	*East*	*West*	*South*	
No. of factories	8	9	11	20	48
Total no. of sources	14	17	20	42	93
Distance in kms.					
1— 20	11	7	10	27	55
21— 40	3	5	4	10	22
41— 50	—	2	1	2	5
51— 60	—	—	1	—	1
61— 70	—	3	1	—	4
71— 80	—	—	—	1	1
81— 90	—	—	—	—	—
91—100	—	—	—	1	1
101— 110	—	—	1	—	1
111—120	—	—	—	—	—
121—130	—	—	1	1	2
131 200	—	—	—	—	—
Above 200	—	—	1	—	1

SOURCE:— Govt. of India: *Report on the Comprehensive Review of the Cement Industry*, Tariff Commission, 1974.

Table 3.3

Unitwise Break-up of Raw Material Cost, 1969-70

(Rs. per tonne)

Unit	*Limestone*	*Gyspum*	*Slag*	*Other raw materials*	*Total raw material*
1.	23.10	2.70	—	—	25.80
2.	31.80	3.00	—	—	34.80
3.	27.00	4.90	—	—	31.90
4.	24.20	2.90	—	1.00	28.10
5.	19.70	3.20	—	1.40	24.30
6.	13.00	3.30	—	0.10	16.40
7.	4.50	1.60	—	1.10	7.20
8.	N.A.	N.A.	N.A.	N.A.	N.A.
9.	23.40	3.90	—	0.10	27.40
10.	19.80	3.90	—	0.80	24.50
11.	11.70	2.40	—	1.50	15.60
12.	20.10	2.00	—	—	22.10
13.	6.20	2.90	—	11.40	20.10
14.	19.60	1.70	—	6.20	27.50
15.	11.40	3.00	—	0.10	14.50
16.	N.A.	N.A.	N.A.	N.A.	N.A.
17.	17.80	4.30	—	0.40	22.50
18.	22.70	2.00	—	0.40	25.10
19.	10.10	2.80	—	12.30	15.20
20.	15.10	2.80	—	—	17.90
21.	7.60	3.80		0.40	11.80
22.	6.50	4.40	—	0.10	11.00
23.	5.60	3.00	—	1.40	10.00
24.	17.80	2.30	—	1.80	21.90
25.	8.80	2.10	—	1.70	12.60
26.	16.60	5.80	—	3.60	26.00
27.	17.60	3.80	—	0.60	22.00
28.	12.30	4.40	—	3.00	19.70
29.	6.80	4.80	—	2.60	14.20
30.	6.70	1.60	—	0.30	8.60
31.	7.70	5.00	—	2.50	15.20
32.	29.10	4.70	1.60	1.40	36.80
33.	30.00	3.60	—	1.20	34.80
34.	18.90	3.10	1.80	2.50	26.30
35.	22.90	3.60	—	3.40	29.90
36.	15.70	3.00	0.70	—	19.40
37.	25.20	5.40	—	1.30	31.90
38.	11.80	5.30	10.20	—	27.30
39.	12.60	2.90	0.80	0.70	17.00
40.	N.A.	N.A.	N.A.	N.A.	N.A.
41.	6.00	5.60	11.80	—	23.40
WEIGHTED AVERAGE	*15.10*	*3.50*	*1.20*	*1.50*	*21.30*

SOURCE – NCAER (1978) "Cement Industry in India – problems and prospects".

Table 34

Unitwise Break-up of Raw Material Cost, 1975-76

(Rs. per tonne)

Unit	*Limestone*	*Gypsum*	*Slag*	*Other raw materials*	*Total raw material*
1.	56.80	5.10	—	—	61.90
2.	74.80	6.40	—	—	81.20
3.	65.90	8.90	—	2.30	77.10
4.	33.70	2.00	—	17.80	53.50
5.	44.90	4.30	—	1.30	50.50
6.	31.00	5.30	—	0.80	37.10
7.	11.30	1.50	—	1.70	14.50
8.	31.60	3.60	—	0.80	36.00
9.	39.60	8.30	—	—	47.90
10.	40.90	6.80	—	—	47.70
11.	20.30	4.70	—	3.10	28.10
12.	33.10	3.10	—	1.00	37.20
13.	14.00	3.80	—	22.30	40.10
14.	35.40	2.50	—	2.80	40.70
15.	25.50	5.90	—	0.90	32.30
16.	21.70	5.80	—	—	27.50
17.	28.50	5.20	—	0.10	33.80
18.	25.00	6.30	—	3.10	34.40
19.	38.10	3.10	—	0.50	41.70
20.	24.20	5.00	4.20	0.20	33.40
21.	14.60	7.10	—	1.80	23.50
22.	13.90	0.80	—	2.10	24.80
23.	9.00	2.90	—	5.10	17.00
24.	40.10	3.20	—	2.40	45.70
25.	15.80	2.40	—	4.40	22.60
26.	24.70	2.90	—	4.20	31.80
27.	22.40	7.60	—	1.40	31.40
28.	21.20	4.20	—	2.70	28.10

Table 3·4 (contd)

(Rs. per tonne)

Unit	*Limestone*	*Gypsum*	*Slag*	*Other raw materials*	*Total raw material*
29.	11.60	6.40	—	2.40	20.40
30.	14.30	3.30	—	1.20	18.80
31.	19.50	7.50	—	1.60	28.60
32.	56.90	6.20	6.90	1.60	71.60
33.	60.10	6.00	3.00	1.80	70.90
34.	32.70	7.30	5.90	4.90	50.80
35.	35.60	6.30	5.90	5.20	53.20
36.	35.30	7.00	8.50	0.20	51.00
37.	37.00	7.90	6.60	1.30	52.80
38.	28.00	6.70	21.40	0.10	56.20
39.	27.00	6.40	16.90	0.80	51.90
40.	41.60	6.10	0.90	0.70	49.30
41.	8.90	9.80	26.60	—	45.30
WEIGHTED AVERAGE	*25.80*	*6.60*	*1.70*	*3.70*	*37.80*

SOURCE: NCAER (1978) "Cement Industry in India - problems and prospects".

Freight equalization on the cement transported and fixed retention prices allowed to the manufacturers on the naked cement produced naturally induced the entrepreneurs to minimize the cost of production of cement (so as to maximize the profit margin) without any regard to the cost of transporting the cement produced to the consuming centres.

This inevitably led to the location of cement plants in areas near limestone deposits (See Table 3.2), as the cost of transporting limestone constituted one of the largest items of the cost of cement manufacture. Therefore, there has tended to be a locational concentration of the cement industry in the South and West, where most of the good quality limestone is found (See Table 3.5). Since a large part(over 40%) of the market for cement has been in the North, East and North-East (See Table 3.6) this has imposed an avoidable burden on the country's transportation system.

The regional imbalance has become increasingly pronounced over the years. For instance, the West and the South which together accounted for 55.2% of the industry's total capacity in 1960, accounted for 65.48% in 1970 and 66.2% in 1980, and are expected to account for 67.32% of the total capacity anticipated by 1990, if the presently approved and contemplated schemes fruitify.

TABLE 3.5

Regionwise Distribution of Installed Capacity in the Cement Industry, 1950-51 to 1982-83.

(%)

	1950-51	1955-56	1960-61	1965-66	1970-71	1975-76	1980-81	1982-83
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
REGION								
NORTH	14.3	22.3	22.1	21.0	17.6	17.5	17.4	15.7
EAST	27.4	25.6	22.7	19.9	16.9	17.6	16.4	5.4
WEST	23.1	22.5	21.3	26.4	28.6	29.3	31.3	45.5
SOUTH	35.2	29.6	33.9	32.7	36.9	35.6	34.9	33.3
TOTAL	100	100	100	100	100	100	100	100

SOURCE: (1) Tariff Commission Reports for columns (1) to (4).

(2) "Cement Production and Despatches" for columns (5) to (8).

TABLE 3.6

Regionwise Consumption of Cement 1971-80.

(%)

YEAR	NORTH	EAST	WEST	SOUTH	ALL INDIA
1971	28.3	16.4	27.3	28.1	100
1975	29.0	19.9	25.9	25.2	100
1980	25.3	19.8	26.9	29.9	100

SOURCE: 'Cement Production and Despatches' (1981).

Before 1966, the basis for fixing prices varied from the 'cost plus' principle for individual plants to a uniform base price with additional provisions of higher prices to cover the costs of the high cost plants. Cement prices were briefly decontrolled from January 1966 to January 1968. A uniform price system prevailed from April 1969 to May 1979. This was followed by a 3-tier price system in 1979, with different retention prices being fixed for low, medium and high cost units.

In 1982, cement was partially decontrolled, and a dual pricing system was introduced for the first time, whereby 66.6% of the installed capacity for existing units and 50% of the installed capacity for new and sick units (later reduced to 65 and 45% respectively in 1984, and 60% and 40% respectively in 1985) was to be sold to the government as levy cement, at a controlled common retention price, while the remaining output could be sold in the open market. The retention price or the levy price itself was based on a uniform price system with specified premia for certain plants.

But, price and distribution controls can only be justified as short run measures of dealing with shortages. In the long run, the only reasonable answer to short supplies lies in stepping up production in every possible way within the framework of national priorities. An attempt to encourage greater production prompted the government to announce a 12% return on networth to all existing units in 1977.

In 1979, the government accepted the recommendations of the Lavraj Kumar Committee, especially that of a special price for new units and expansions, assuring them a 12% post tax return, too. Even more important, the Committee recommended an automatic and periodical escalation in price to compensate for increases in the costs of selected inputs which were beyond the control of the cement industry, on the basis of rigid consumption norms, and this was accepted by the government.

This triggered off a remarkable bout of investment activity on the part of entrepreneurs, including large, professional houses like Larsen & Toubro, and Coromandel Fertilizers, who were entering the cement industry for the first time.

As a result, no less than 25 million tonnes of additional capacity (which was even more than the then existing capacity) got committed, many of the plants concerned being of 0.5 to 1 million tonnes capacity, based on the most modern technology. They were also phased in such a manner that about 4 to 5 million tonnes would materialise every year, spread over 5 to 6 years.

This assured prospect of continued growth set the stage for the next radical change in government policy - namely, partial decontrol, which was adopted in February 1982.

The new policy of partial decontrol involved a uniform price for both existing and new units. The problems that such an approach could give rise to were recognised, and these were sought to be moderated by prescribing a lower levy quota for new and sick units.

The new price policy was reinforced by a liberal policy in regard to industrial licensing. MRTP/FERA companies were freely allowed to obtain industrial licences.

The enthusiastic response of the industry to the new policy package can be seen from the capacity installation during the Sixth Plan period, and the projects which are in the pipe line for the Seventh Plan.

TABLE 3.7

Capacity installed during the 5-Year Plans.

(Million tonnes)

5 Year Plans	Target	Achievement
I (1951-56)	5.3	5.0
II (1956-61)	16.0	9.3
III (1961-66)	15.0	12.0
IV (1969-74)	-	19.8
V (1974-79)	23.5	22.6
VI (1980-85)	43.0	44.0
VII (1985-90)	62.0	

SOURCE: "ACC's Data on Cement Industry".

TABLE 3.8

Production of Cement during the Five Year Plans.

(Million tonnes)

5 Year Plan	Target	Achievement
I (1951-56)	4.8	4.6
II (1956-61)	13.0	8.0
III (1961-66)	13.0	10.8
IV (1969-74)	18.0	14.7
V (1974-79)	20.8	19.5
VI (1980-85)	34.5	30.5
VII (1985-90)	49.0	

SOURCE: "ACC's Data on Cement Industry".

Having discussed the impact of price controls on the producers of cement, the following section of this chapter is concerned with considering their impact on the market for cement as a whole.

Price controls are normally introduced (a) to protect the interests of consumers (b) to ensure an adequate supply of raw materials and intermediate inputs to 'priority' sectors as reasonable prices, (c) to prevent or mitigate inflation— in the face of scarcity of products with strong forward linkages.

As far as protecting the interests of consumers is concerned, the commodities subjected to price and distribution controls have generally been either those in respect of which the government and public sector undertakings are the major end-users, e.g. cement, or items of 'mass consumption', e.g. sugar.

However, while the government may be able to ensure that it is able to obtain the commodity concerned at the controlled price, as far as the general public is concerned, it would be extremely unrealistic to presume that a government can, simply by issuing a statutory notification, prevent the price of any product from rising above the prescribed level. Producers, traders, and most of all, consumers, know that statutory price controls can be circumvented in various ways.

For the consumer, price control rarely means that supplies are available at controlled prices. Very often, he finds that no supplies are available except to those who are prepared to find ways and means of paying more than the controlled price. The extent to which the black market price exceeds the controlled price would depend upon the elasticities of demand and supply, and, most important, the administrative efficiency of the government in implementing the controls. Cement is the most obvious example of an essential commodity where price and distribution controls resulted in scarcities and black marketing.

In addition to a lack of administrative efficiency in implementing controls, one major problem seems to lie in the fact that price controls, which are basically an instrument for dealing with temporary shortages have, in India, been used as long-term measures.

The short run (i.e. a period of unchanged capacity) can conveniently be used for controlling prices on an average variable cost basis because, well established industries continue to carry on with their production plans even if they cannot cover their fixed costs in the short run, and because big companies maintain large inventories of raw materials and finished products which they can utilize to meet the additional demand generated by the imposition of price controls.

However, in the long run, perpetuation of price controls would provide an incentive to resources being diverted into industries which are not controlled.

If price controls are meant to protect the consumers of essential goods, we have to ensure that production increases, because in the long run you cannot protect them if output does not expand.

Therefore, price controls may need to be complemented by other measures to ensure the growth of the industry.

Alternatively, the controlled price must be renumerative enough to stimulate further production of the good in question. This would be much more helpful to consumers than a price which has a negative impact on the growth of output.

While pursuing a policy of keeping administered prices profitable, however, care should be taken to see that prices are not high on account of inefficiency. If prices are fixed on a 'cost-plus' basis in a market sheltered from foreign competition, producers will not want to lower costs because that would mean a reduction in the controlled price and not necessarily a better return to them. (This has already been witnessed in the case of the Indian cement industry). Blanket protection provided against imports would also reduce the incentive to lower costs.

As far as administering prices for essential commodities in short supply is concerned, it may be wiser to adopt a system of dual pricing where the State agrees to provide a reasonable profit margin to producers, while simultaneously trying to protect the more vulnerable sections of the society or the priority sectors of the economy against excessive rise in prices[69] through subsidies (though, of course, even the dual pricing method does have its own drawbacks).

However, if the system of dual pricing involves partial decontrol, so that a part of the output can be sold

in the open market then, in an oligopolistic industry, there is always the danger that a tendency toward cartelization may arise, as has happened in the case of the Indian cement industry.

The partial decontrol of cement towards the end of February 1982 was a replacement of government control not by the free forces of the market, but by the organized monopolistic collusive powers of the cement manufacturers in the form of the Cement Manufacturers' Association (CMA). The CMA 'divided' the country into six zones and 'fixed' the price of 'free sale' cement between Rs. 65 and Rs. 68 per bag, i.e. between Rs. 1,300 and Rs. 1,360 per tonne - over four times the prices for levy cement.

The new retention price for levy cement itself had been fixed at a much higher level than what obtained earlier.

(NOTE: The retention price for cement from May 3, 1981 to February 28, 1982 was fixed as follows:

for existing units:

Rs. 233.39 per tonne for low cost units.

Rs. 253.39 per tonne for medium cost units.

Rs. 268.39 per tonne for high cost units.

and Rs. 344.39 per tonne for expansions/new units.

The retention price fixed for levy cement at the end of February 1982 was:

Rs. 335 per tonne for OPC (Ordinary Portland Cement) and Rs. 320 per tonne for PPC (Portland Pozzolana Cement)

It was suggested that the black market prices of cement (at Rs. 2000 per tonne, i.e. about Rs. 100 per bag) were even higher than the prices fixed by the CMA, and that, therefore, the new policy would divert resources away from the traders and into the hands of the manufacturers, leading to higher and more productive investment.

But, firstly, what was the assurance that the massive amount of resources thus made available to manufacturers would be used for the stated objectives only, and, more important, was it really fair to 'tax' the consumers so heavily in order to raise funds for capacity expansion?

After all, a similar attempt at the 'decontrol' of prices and distribution of cement made in January 1966, had failed to bring about the desired results, because the regulation of prices and distribution had been taken over by the Cement Allocation and Co-ordinating Organization (CACO) set up by the cement manufacturers. And eventually, the government had reimposed controls with effect from January 1, 1968.

Details of Retention Price admissible to the Cement Industry from 1.11.1961

	Period	Retention Price per tonne of cement	Remarks
1.	1.11.1961 to 31.5.1963	Rs. 69.50/72.50/75.00	
2.	1.6.1963 to 30.6.1964	Rs. 72.25/75.25/77.75	
3.	1.7.1964 to 31.5.1965	Rs. 73.50/76.50/79.00	Three Tier Price System
4.	1.6.1965 to 31.12.1966	Rs. 77.50/80.50/83.00	
5.	1.1.1967 to 15.4.1969	Rs. 90.50/93.50/96.00	
6.	16.4.1969 to 14.9.1973	Rs. 100	
7.	15.9.1973 to 1.8.1974	Rs. 110.00	
8.	2.8.1974 to 14.9.1974	Rs. 134.20	
9.	15.9.1974 to 30.9.1975	Rs. 139.15	Uniform Pricing System
10.	1.10.1975 to 30.6.1976	Rs. 157.75	
11.	1.7.1976 to 31.10.1976	Rs. 161.40	
12.	1.11.1976 to 30.9.1977	Rs. 159.55	
13.	1.10.1977 to 2.7.1978	Rs. 161.12	
14.	3.7.1978 to 6.12.1978	Rs. 165.82	
15.	7.12.1978 to 2.5.1979	Rs. 168.91	
16.	3.5.1979 to 2.5.1980	Rs. 185/205/220	Three Tier Price System
17.	3.5.1980 to 2.5.1981	Rs. 198.65/218.65/233.65	
18.	3.5.1981 to 27.2.1982	Rs. 233.39/253.39/268.39	
19.	28.2.1982 to 17.7.1984	Rs. 335.00 OPC Rs. 320.00 PPC	Uniform Pricing System
20.	18.7.1984 to 14.12.1986	Rs. 375.00 OPC Rs. 360.00 PPC	
21.	From 15.12.1986	Rs. 399.50 OPC Rs. 384.50 PPC	

The question of to what extent the decontrol of 1982 really did achieve its desired objectives is discussed in the following chapter.

CHAPTER 4

CAPACITY UTILIZATION AND INVESTMENT BEHAVIOUR

The study of capacity utilization is a relatively recent phenomenon. Until the 1950's the neo-classical economists either ignored the concept completely, or regarded the level of capacity utilization as being exogeneously determined. It was only Keynes (at the macro-level) and Chamberlain (at the micro-level) who first explicitly considered the possibility of excess capacity.

Over the last three decades, the concept of excess capacity has attracted a great deal of attention amongst economists of the third world countries striving for rapid industrial growth in the face of scarcity of capital. This is because, underutilization of capacity in a particular industry not only implies an uneconomic use of the capital which has been invested, but also raises the cost of production and lowers the rate of profit on the capital employed which, in turn, generates disincentives for the expansion of existing firms and setting up of new ones. Furthermore, the lower level of output in the industry concerned can create very serious problems for those industries in which it is required as an input. For instance, underutilization of capacity in the cement industry would directly have an adverse impact on investment in construction activity in a situation of

excess demand for cement.

Before proceeding any further with the discussion of excess capacity, it is imperative to state explicitly what exactly one means by the term "capacity", since this concept has been used in at least three different ways so far.

In a competitive industry, the capacity of a firm is regarded as the level of output corresponding to the minimum point on the long run average cost curve.

Another concept involves induced investment, where some version of the accelerator principle is utilized to explain investment behaviour. In this respect, it involves specifying a level of output which, if exceeded, would signal the need for additional investment in plant and equipment.[1]

The third concept of capacity, which is the one most commonly used in the developing economies, and which has been adopted in this dissertation, is the technical or

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1. (a) Phillips, A - "Measuring Industrial Capacity and Capacity Utilization in Under developed Countries" (1970).

   (b) K.B. Das - "Cement Industry of India" (1987).

engineering capacity. The technical concept, in turn, has several variants - such as, licensed capacity, designed capacity, installed capacity or attainable capacity.

Installed capacity refers to the maximum possible level of output that can be produced by a plant on a regular basis, under normal working conditions specified at the time of installation; (normal working conditions, here, refers to the number of working days in a year, the number of shifts per working day, the number of hours in a shift, output per hour & per shift, etc.).

However, as Morris Solomon[2] has pointed out, the very concept of installed capacity itself is a flexible one. Because, in many cases, production can be increased by installing balancing equipment and machinery without changing the declared capacity, or by contracting out a particular process where the capacity of that processing activity is a limiting factor.

This arises because of variations in the optimum production capacities in successive processes. If the output mix or the quality of the products can be varied, it might

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2. "Better Plant Utilization for India - A Blue print for Action".

lead to changes in the level of utilization of a given capacity.

Attainable or achievable capacity refers to the optimum level of output possible per unit of time, which the management feels the plant is capable of producing over a long period of time under the given normal operating circumstances (that is, the number of shifts normally worked, the normal duration of time required for repairs and maintenance, etc.).

Attainable capacity would equal the installed capacity only in the event of a complete absence of any input constraints and the presence of ideal operating conditions.

Whether one adopts the concept of installed or attainable capacity, practical difficulties arise in reporting the capacity figures for an industry as a whole which is comprised of a large number of units which are working on different shift bases. In such a case, some amount of arbitrariness is inevitable in assessing whether an industry is working on a one or two or three shift basis.

For instance, in an industry where some units are working on a two shift and others on a three shift basis, there would be some critical number of units or percentage

of the total capacity in that particular industry which should be working for three (or two) shifts before the industry is stated to be working on three (or two) shifts. (Rarely does one find any reference to an industry working on a fractional shift basis, eg. $2\frac{1}{3}$ shifts).

A similar problem arises in the classification of individual units by the number of shifts worked per day.

Again, one would have to decide for how many days in a month the industry should work on three shifts before it is identified as a three shift industry. If the number of units working on three shifts is less than that, the capacity figures would be shown on a two shift basis, even though some units are actually working on three shifts.

Conversely, the entire industry would be reported to be working on three shifts if the number of units or percentage of capacity exceeds the critical limit, even though some units may still be working only two shifts a day.

The production figures, however, would reflect the total actual level of production in the industry, and so we would get an inaccurate estimate of the extent of capacity utilization.

Again, if we take our data from a source where the capacity figures relate to the end of the year, while the production data are for the year as a whole (which is very often the case), we would get an over-estimate of the extent of the underutilization of capacity (unless the entire expansion of capacity takes place on the first working day of each year, which, of course, is extremely unlikely).

These limitations have to be kept in mind while making any analysis of the estimates of capacity and capacity utilization.

The Cement Manufacturers' Association (CMA) has represented that in assessing the capacity of cement plants, the licensed or installed capacity should be accepted as the capacity for cost estimation purposes.

However, there is no rationale for fixing the capacity of the cement plant at its licensed capacity, since it is not necessary that a cement manufacturer will install the level of capacity which has been licensed, as can be seen from the available data on licensed and installed capacity (see Table 4.1).

Besides, the actual level of output which a plant can produce also depends on the quantity and quality of the raw materials available, and not just the installed capacity.

TABLE 4.1

Annual Licensed and Installed Capacity in the Cement Industry (Companywise)in 1975.

(in lakh tonnes)

Name of Company	Licensed Capacity	Installed Capacity
1. The A.C.C. Ltd.	68.79	67.99
2. Dalmia Dadri	2.39	1.93
3. Saurashtra	8.63	8.00
4. U.P. State Cement Corporation-		
Churk	4.75	4.80
Dalla	4.32	4.00
5. Ammasandra (Mysore Cements Ltd.)	4.00	4.32
6. Jaipur Udyog Ltd.	10.00	8.55

Source of Data: Statistics compiled by the Cement Manufacturers' Association.

Furthermore, as the 1981 BICP Committee pointed out, taking the "installed capacity" — as per the original manufacturer's rating— may militate against the older units whose kiln capacity may have deteriorated over the years.

Ideally speaking, therefore, the capacity of a plant should be defined in terms of the output which it can produce, given the quality of raw materials and availability of infrastructural facilities, the normal duration of time required for routine repairs and maintenance, number of shifts normally worked, length of each shift and number of working days in a year. Taking account of all the relevant aspects and constraints, the 1978 BICP Committee fixed the level of achievable capacity at 85% of the installed capacity.

The two High Level Committees set up by the BICP to study the cement industry in 1978 and 1981 respectively, assessed the annual capacity of each kiln on the basis of the best daily kiln capacity achieved over the previous five years, and three years, respectively. Capacity was assessed first in terms of clinker capacity, which was then translated into capacity for cement production.

The 1978 High Level Committee based its assessment of capacity on the best daily kiln capacity achieved,

taking the previous five years into consideration. Capacity was assessed first in terms of clinker capacity, which was then translated into capacity for cement production.

Since the quality of coal has deteriorated since then, the 1981 Committee decided to consider the period 1978-1979 to 1980-81 for studying the performance level of cement plants in terms of output.

Data on the amount of clinker produced in each kiln over the period was collected. Assuming 330 working days in the year, annual kiln capacity was derived by multiplying the best of the three annually achieved hourly kiln output by 7920 (i.e. 24 hours x 330 days).

Capacity was worked out for each kiln in a plant (and the total was taken as the achievable capacity of the plant). In assuming 330 days, provision for a down-time of 35 days for normal maintenance work had been allowed, because the two BICP Committees estimated that on an average, the down-time arising from reasons beyond the control of the management was about 35 days a year, for the cement industry as a whole.

However, the validity of such an approach, where annual capacity is estimated on the basis of the best capacity achieved over a period of time, is open to question in an oligopolistic industry where excess capacity may deliberately be maintained with the intention of deterring entry.

Coming now, to the question of capacity utilization, one has to accept the fact that at the macro level, some amount of excess capacity in the industrial sector has to be reckoned with even if planning and execution of industrial programmes is perfect, because of the difficulties involved in complete synchronization of inter-industry demands.

At the micro level also, hundred percent capacity utilization, even in the first shift, for an industry as a whole, would be a very rare phenomenon. Some units might achieve it for a couple of years, but to maintain it continously over a number of years is practically impossible, because so many conditions have to be fulfilled continously before one can run a plant to production capacity and quite often, it is just not possible to obtain all these conditions simultaneously.

Besides, in deciding what level of capacity he would like to install in a new industrial unit, an entreprenur would generally taken into account not only the immediate

level of demand, but also the demand expected in the next say, five or ten years. He would, therefore, tend to start a new industrial unit with capacity considerably in excess of the immediate demand.

Even when no excess capacity has been preplanned in a new unit, teething troubles may some times make some level of underutilization inevitable in a new unit in the period immediately following the commissioning of the unit.

Again, sometimes there are periodical breakdowns in the plants which can not be entirely avoided. Besides, plants do have to be closed down periodically for repairs.

Due to the above reasons, even with an average level of efficiency, it may not be possible to reach a level of capacity utilization above 90%.[3]

Of course, many of the factors causing underutilization of capacity, such as strikes and lockouts, power failures, shortage of raw materials and infrastructural constraints can be avoided through better planning. By developing a much more comprehensive system of projections for demand and supplies, the policy makers certainly can keep the problem of excess capacity within manageable proportions.

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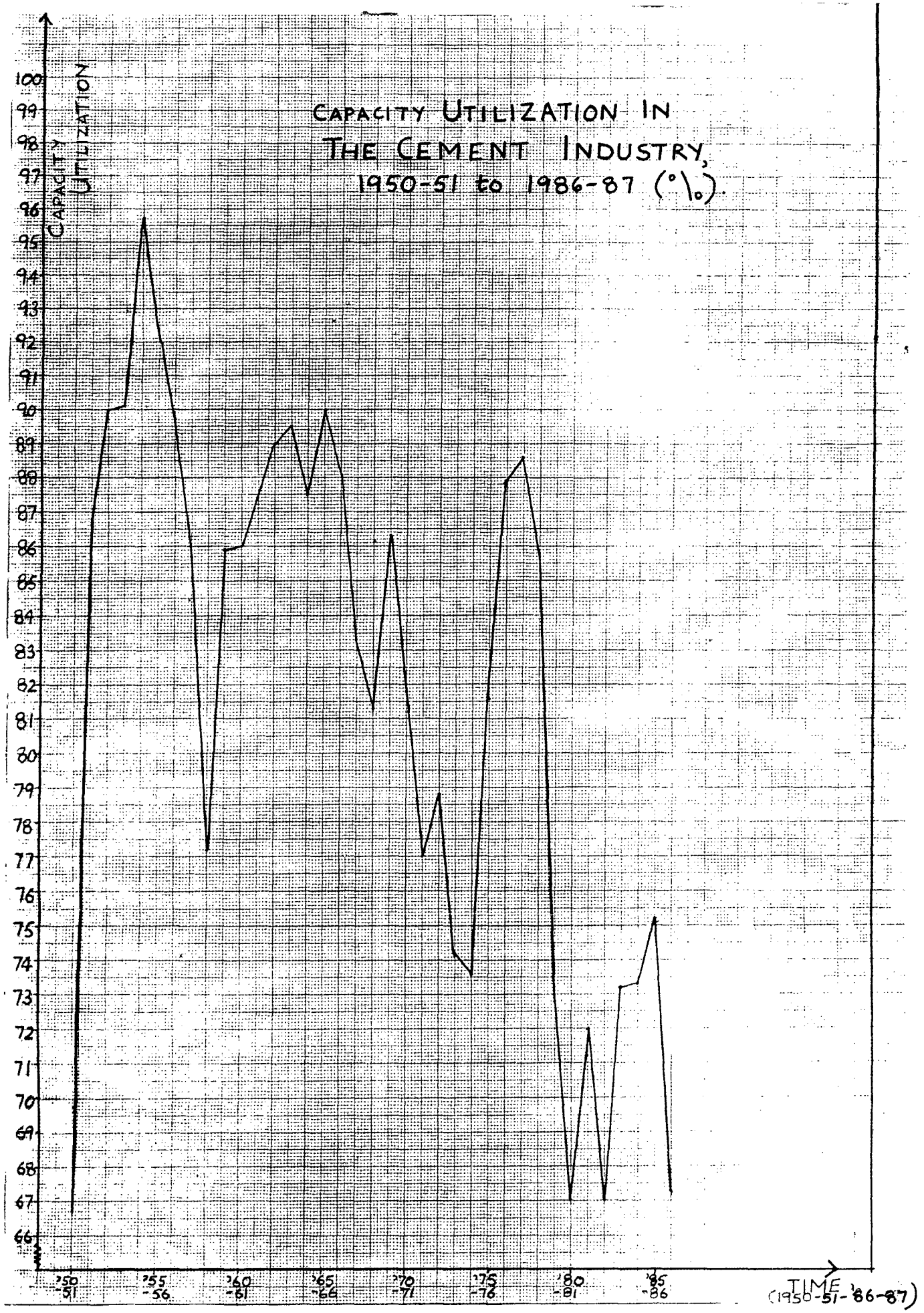
3. " C apacity Utilization in the Manufacturing Sector" - Commerce Research Bureau, 1970.

The level of capacity utilization depends on the number of stream days (the actual number of days the plant is on line) and the level of output achieved during those days.

The number of stream days is affected by plant shut downs due to various reasons such as mechanical trouble, breakdown of equipment, shortage or timely nonavailability of inputs, etc.

The level of output produced during the period when the plant is on line may be less than the daily rated capacity because of the low processing efficiency of the plants, and because some amount of output is lost every time a plant is started up after shut down. For, there would be a time gap of 4 to 24 hours between the coming on line of the plant and the emergence of the final output, the length of this gap depending on the technology chosen and the duration of the shut down.

To sum up, therefore, the level of utilization of installed capacity depends on the number of stream days, the processing efficiency of the various equipments, the frequency and duration of power shut downs, the avaialability of the other infrastructural facilities and inputs, and of course, on the size and age pattern of the industry.


CAPACITY UTILIZATION IN THE CEMENT INDUSTRY, 1950-51 to 1986-87 (%).
CAPACITY UTILIZATION
100
99
98
97
96
95
94
93
92
91
90
89
88
87
86
85
84
83
82
81
80
79
78
77
76
75
74
73
72
71
70
69
68
67
66
'50 -51
'55 -56
'60 -61
'65 -66
'70 -71
'75 -76
'80 -81
'85 -86
TIME (1950-51 - '86-87)

Graph 4.1

Another possible reason for the maintenance of excess capacity could be inadequate demand, but this was not applicable for the Indian Cement Industry.

In this chapter, an attempt has been made to offer an explanation of the downward trend in the capacity utilization ratio of the cement industry as a whole, and of the observed inter-firm differences in the level of capacity utilization.

Table 4.2 and graph 4.1 displaying the level of capacity utilization in the cement industry as a whole over the period 1951-52 to 1986-87, show a distinctly declining trend over the entire period. While the capacity utilization ratio (output as a percentage of the average installed capacity during the year being considered) was substantially above 90% almost throughout the 1950's, and remained at a satisfactory level of 85 to 90% during the 1960's, it has been below 85% (the BICP's estimate of attainable capacity, taking into account all the relevant constraints) since then, and, in fact, has been consistantly below 75% since 1980. The average level of capacity utilization for the period 1980 to 1984 was only 71.5%.

Ever since the cement industry was brought under price and distribution controls during the second world war, cement manufacturers have repeatedly complained about the shortage of raw materials and inadequacy of infrastructural

TABLE 4.2

Capacity Utilization in the Cement Industry, 1951-52 to 1984-85

Year	Capacity Utilization as percentage of Average Installed capacity for the year.
1951-52	94.3
1952-53	92.3
1953-54	95.2
1954-55	97.8
1955-56	95.8
1956-57	96.3
1957-58	93.8
1958-59	82.4
1959-60	89.0
1960-61	89.9
1961-62	88.3
1962-63	91.8
1963-64	91.3
1964-65	89.9
1965-66	93.1
1966-67	90.2
1967-68	87.1
1968-69	82
1969-70	86
1970-71	82

Year	Capacity Utilization as percentage of Average Installed Capacity for the year
1971-72	77
1972-73	79
1973-74	74
1974-75	74
1975-76	82
1976-77	88
1977-78	88
1978-79	86
1979-80	73
1980-81	67
1981-82	72
1982-83	68
1983-84	73
1984-85	74

Source: 1951-52 to 1967-68 - Acc's data on Cement Industry.

1968-69 - 1984-85 - "Cement Data Book 1984" published by the office of the Development Commissioner for the Cement Industry.

Note - It is possible that the estimates of capacity utilization for 1951-52 to 1967-68 (Source-ACC) may have an upward bias, as the ACC's estimates of capacity utilization for the period 1968-69 to 1984-85 obtained from the ACC's"Data on cement Industry" are higher than the estimates obtained from the Cement Data Book. See Table 4.3.

TABLE 4.3

Capacity Utilization as percentage of Installed Capacity.

Year	ACC estimates	Cement Data Book estimates
1968-69	87.4	82
1969-70	89.0	86
1970-71	85.7	82
1971-72	81.2	77
1972-73	79.6	79
1973-74	74.6	74
1974-75	74.4	74
1975-76	84.0	82
1976-77	87.9	88
1977-78	89.0	88
1978-79	87.0	86
1979-80	74.9	73
1980-81	73.2	67
1981-82	79.6	72
1982-83	77.7	68
1983-84	79.2	73
1984-85	79.4	74

SOURCE: (1) ACC's Data on Cement Industry.

(2) "Cement Data Book 1984".

TABLE 4.4

Capacity Installed in the Cement Industry, 1951-52 to 1984-85.

(million Tonnes)

Year	Installed Capacity at year end
1951-52	3.8
1952-53	4.0
1953-54	4.4
1954-55	4.6
1955-56	5.0
1956-57	5.8
1957-58	7.0
1958-59	7.9
1959-60	8.5
1960-61	9.3
1961-62	9.5
1962-63	10.0
1963-64	10.5
1964-65	11.2
1965-66	12.0
1966-67	12.6
1967-68	13.8
1968-69	15.0
1969-70	16.0

Year	Installed Capacity at year end
1970-71	17.6
1971-72	19.5
1972-73	19.7
1973-74	19.7
1974-75	20.0
1975-76	21.1
1976-77	21.6
1977-78	21.9
1978-79	22.6
1979-80	24.3
1980-81	27.0
1981-82	29.3
1982-83	33.2
1983-84	36.9
1984-85	42.8

SOURCE: ACC's Data on Cement Industry (1986).

facilities. It is not denied that the infrastructural facilities available in the country leave a lot to be desired but, if the secular decline in capacity utilization was entirely or even mainly due to any persistent constraints being faced by the industry — on either the supply or demand side, then one would have expected the rate of capacity expansion to gradually taper off, or at least, slow down significantly. However, what surprises one is the fact that inspite of the almost continuous increase in the level of unutilized capacity available, more and more capacity was being installed throughout this period (see Table 4.4). One wonders why an industry which already has a substantial amount of underutilized capacity should seek to expand its capacity even further without first attempting to utilize its excess capacity, and, in fact, why so much excess capacity was being maintained in the first place, when there was so much of excess demand for cement in the domestic market.

This paradoxical situation can not be explained away merely by claiming that the increase in installed capacity was due to the entry of new firms into the industry for, although several new firms were set up during this period, many of the existing firms also expanded their capacity considerably. For instance, the Cement Corporation of India (CCI) which was established in 1970, had expanded its capacity to 34 times the original level by 1984, the U.P. State Cement

Corporation had increased its capacity to more than five times the 1966 level by 1984 (see Table 4.5). The Birla Jute Manufacturing Company had increased its capacity to four times the 1966 level, by 1984. In absolute terms, the largest increase in capacity of 38.47 lakh tonnes was recorded by the ACC.

If the excess capacity was entirely due to low profitability and/or shortage of raw materials and infrastructural facilities, as has been repeatedly claimed by the cement manufacturers, then how would one account for - firstly, the entry of so many new firms into the industry which, logically speaking, should have, therefore, invested their funds in more profitable industries for, virtually all these firms were ones for whom cement was a major, if not the principal product, and secondly, the expansion of capacity by existing firms, who ought to have been aware of the scarity of raw materials and lack of infrastructural facilities. Why would these firms expand their capacity at all if they felt that it was not possible for them to produce more output?

If the excess capacity was neither due to supply nor due to demand constraints, then it obviously must have been maintained deliberately. In an oligopoly, firms do maintain excess capacity intentionally in order to deter entry. The

TABLE 4.5

Rated Capacity of some firms

(in lakh tonnes)

	1966	1972	1978	1984
ACC	46.9	67.3	70.1	85.3
CCI	-	2.5	6.0	27.5
U.P.State Cement Corporation	4.8	8.8	8.8	25.5
Birla Jute Manufacturing	5.6	9.8	15.8	22.2
India Cements Ltd.	8.2	15.1	15.1	15.1
J K Cement Works	-	-	3.0	13.4
Larsen & Toubro	-	-	-	11.1
Mysore Cements Ltd.	2.0	4.3	5.1	10.4
Narmada	-	-	-	10.0
Jaipur	7.5	10.2	8.6	9.9
Tamil Nadu	-	4.0	4.0	9.0
Kesoram	-	2.0	4.5	9.0
Saurashtra	5.3	8.6	8.0	8.6
Shree Digvijay	6.4	8.4	8.4	8.4
Century	-	-	-	7.5
Maihar	-	-	-	8.0
Coromandel	-	-	-	7.5
Andhra	1.9	2.4	2.4	7.4
Rohtas	3.2	3.2	5.9	6.2
Panyam	1.7	3.8	5.3	5.3
Dalmia (Bharat)	4.2	1.9	4.0	5.2
Madras	1.9	1.9	4.0	5.2
Kalyanpur	1.5	3.5	3.5	4.8
Chettinad	-	4.0	4.0	4.0

SOURCE: Data obtained from the Cement Manufacturers' Association.

entry of new firms into the cement industry during this period does not necessarily imply that entry deterrence was not attempted or was not successful, because in a situation of increasing demand, where the demand curve shifts outwards (as it seems to have done for cement, see Table 4.6) the existing firms may tolerate some level of entry before resuming their entry deterring activity.

Even more important than entry deterrence, however, it is contended that the expansion of capacity along with its underutilization reflected a policy of deliberately maintaining excess capacity in a situation of excess demand in order to pressurise the government to adopt a more liberal and more profit yielding policy towards the cement industry, since retention prices for cement were fixed on a 'cost plus' basis.

The plausability of this can be seen from the fact that even after the government assured a minimum 14% return on capital employed to the cement units, and later, a more renunerative net post-tax return of 12% on networth for new units, and the levy quota was successively reduced from 100% of actual output to 50% of actual output for existing units and 30% for new and sick units, there has been no improvement in the level of capacity utilization. Though each step towards the liberalization of price and distribution controls was followed by an increase in the capacity installed, there

TABLE 4.6

Demand for Cement

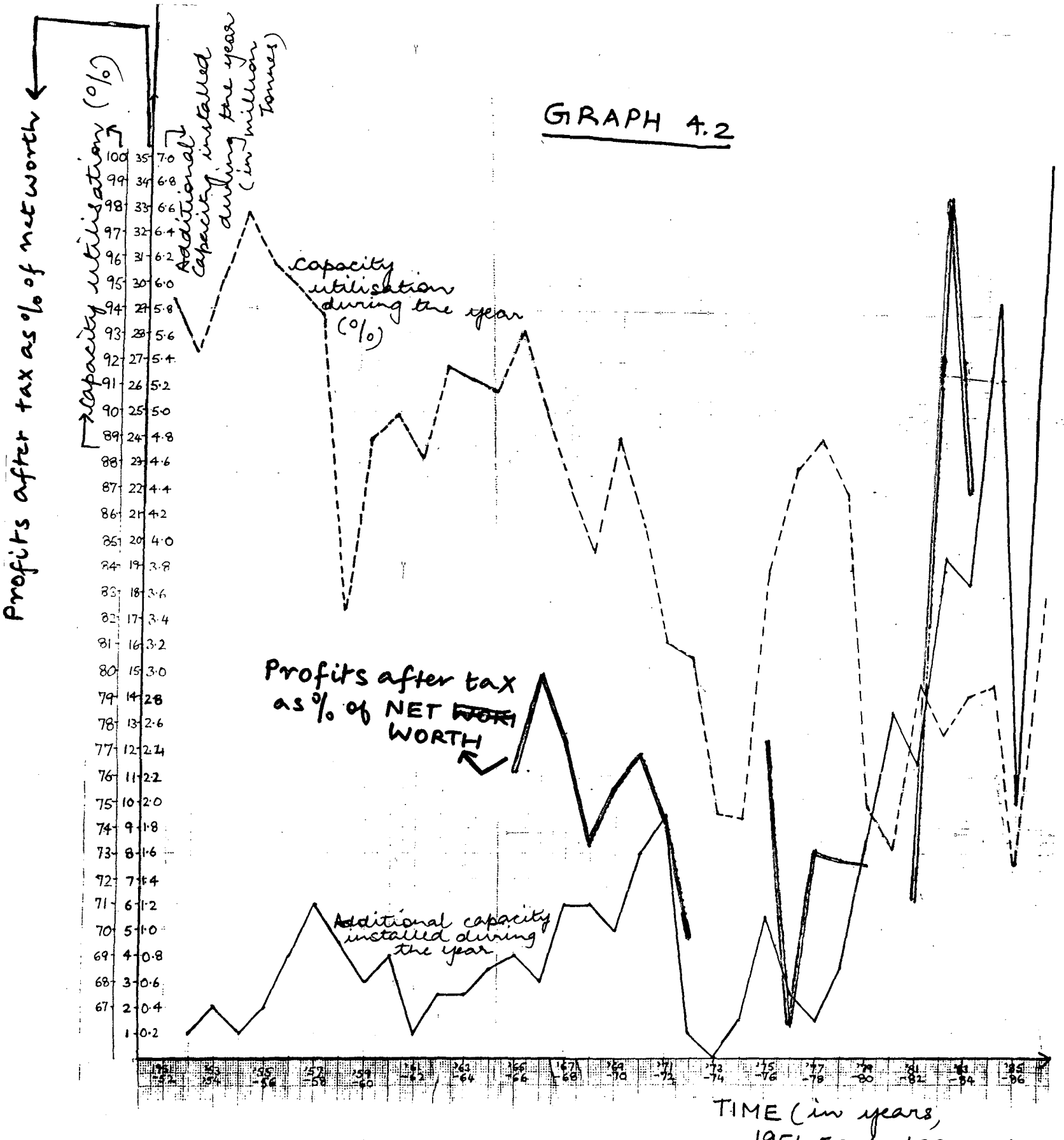
Year	Demand for cement (million tonnes)	Index number of wholesale price of cement.	Index number of wholesale prices (all commodities)
		(Base: 1970-71 = 100)	
(1)	(2)	(3)	(4)
1978-79	24.0	197	185.8
1979-80	25.9	229	217.6
1980-81	28.0	233	257.3
1981-82	30.2	270	281.3
1982-83	32.6	365	288.7
1983-84	35.3	422	316.0
1984-85	37.0	464	338.4

SOURCE: Column 1: "ACC's Data on Cement Industry".

Columns 2 & 3, - Economic Survey 1984-85.

NOTE: The figures for column 1 are quoted from the booklet "Data on the Cement Industry" published annually by the ACC. The method by which the demand for cement was estimated was not stated.

GRAPH 4.2



NOTE : The discontinuity in the "profits after tax as % of networth" curve arises because the numerator was negative for certain years, and data on profits was not available for those years.

was no comparable increase in production, with the result that capacity utilization actually declined.

The graph showing the relationship between the profitability and the additional capacity installed in each year/ capacity utilization also shows that "increase in capacity installed" bears a strong positive relationship to profitability with a lag of one year, whereas the level of capacity utilization bears no systemetic relation to profitability.

If the leading firms in the cement industry did maintain excess capacity as a strategy of entry deterrence and such a strategy were successful, one would expect to find a positive relationship between firm size and profitability, and firm size and excess capacity, where firm size is measured in terms of both market share and capacity installed.

And, if the firms are grouped together according to size (in terms of rated capacity) as has been done in Table 4.7, it can be seen that the highest level of underutilized capacity (amounting to an average of almost 27.80%) was maintained by the firms in the largest size group, i.e. above 800 tonnes.

TABLE 4.7

Degree of Underutilization of Capacity (on the Basis of the size of the plants).

TABLE 4.7

Size of units (1000 tonnes)	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Average
0-100	15.10	26.70	22.60	7.50	8.60	2.60	2.24	-0.30	2.37	22.78	19.58
101-200	8.70	8.10	13.60	6.90	3.60	-3.00	10.68	12.10	23.04	22.74	10.55
201-350	11.40	18.60	27.10	29.30	24.00	12.20	18.51	6.14	31.33	31.00	21.16
351-500	27.50	18.90	26.20	31.50	17.90	8.90	11.97	8.04	21.22	35.43	20.73
501-800	18.00	11.20	12.70	21.70	14.40	4.60	3.14	14.24	19.81	24.10	14.39
800 & above	30.20	20.40	33.97	33.80	33.40	24.00	15.47	16.20	27.17	39.42	27.41
TOTAL	23.68	20.26	24.19	27.96	23.45	12.74	11.43	11.47	22.88	30.28	20.64

SOURCE: Computed from various issues of 'Cement Production and Despatches'.

Note : Underutilized Capacity = $\left(1 - \frac{\text{output}}{\text{installed capacity}}\right) \times 100$

It is also significant to note that there was practically no expansion of capacity in any of the sick units over the entire period, except for Jaipur Udyog Ltd. In fact, in many of them, the rated capacity actually declined.

Therefore the possibility of the leading firms in the cement industry deliberately maintaining excess capacity in order to deter entry certainly can not be ruled out.

TABLE 4.2

Range of Capacity Utilisation and Number of Units (1971-80)

Range in %	71	72	73	74	75	76	77	78	79	80
Below--50	3	9	2	4	5	4	3	0	9	12
50--59	1	2	8	10	2	1	2	6	5	7
60--69	10	3	13	5	10	3	6	3	5	4
70--79	7	12	6	13	7	8	7	6	9	12
80--89	10	12	10	9	8	9	6	10	5	9
90--99	15	11	7	3	10	11	10	9	8	6
100 above	4	6	5	6	11	18	20	19	15	9
Total	50	51	51	51	53	54	54	53	56	59

Source : Computed from the various issues of Cement Production & Despatches, Government of India publications.

CHAPTER-5

SICK UNITS

In 1982, 15 units were identified as "sick" by the BICP and, on its recommendations, were granted certain concessions in the form of fiscal reliefs by way of a reduction in the excise duty and other reliefs by way of further reduction in the levy quota. Further studies were conducted by the BICP in 1983-84 and 1984-85, and the sickness concessions were continued for these units.

Of the 15 units identified, 5 belonged to the A.C.C., 2 to the U.P. state Cement Corporation Ltd., 2 to Tamil Nadu Cements, and 1 each to the Cement Corporation of India, India Cements, Jaipur Udyog Ltd., Kalyanpur Lime and Cement Works, Sone Valley Portland Cement Company Ltd., and Visvesvaraya Iron and Steel Ltd.

The BICP assessed the total capacity of these 15 sick units at 5.864 million tonnes in its 1983-84 and 1984-85 studies. That would amount to about 15.88% of the total capacity of the cement industry in 1983-84 and 13.69% in 1984-85, as total installed capacity in the cement industry had expanded from 36.9 to 42.8 million tonnes between 1983-84 and 1984-85.

Out of the 15 units classified as "sick" by the BICP, the following 12 have been selected for the purpose of this study:-

1. Lakheri (ACC)
2. Dwarka (ACC)
3. Khalari (ACC)
4. Sevalia (ACC)
5. Sindri (ACC)
6. Churk (U.P.State Cement Corporation Ltd.)
7. Dalla (U.P.State Cement Corporation Ltd.)
8. Charkhi-Dadri (CCI)
9. Jaipur Udyog Ltd.
10. Shankarnagar (India Cements Ltd.)
11. Alangulam (Tamil Nadu Cements)
12. Ariyalur (Tamil Nadu Cements)

Out of the 12 sick units considered, only 3 units (ACC-Sindri, and to some extent, CCI-Charkhi Dadri and the Jaipur Udyog Ltd.) seem to have genuine reasons for being sick, in the sense that the underutilization of capacity could be largely attributed to factors beyond the control of the management.

For instance, ACC's plant at Sindri, a wet process plant with 3 kilns installed during 1955 to 1958, was designed for 100% use of Calcium Carbonate sludge as a source of limestone, which was the waste product of the FCI's fertilizer plant located at Sindri itself, just one kilometre away.

However, sludge is now no longer available, as FCI has changed its process of production. Therefore, the cement plant now has to use slag[1] instead, even though it is not designed to grind limestone.

To make matters worse, the sources of limestone deposits are located very far off, and it has to obtain 65% of its limestone from a distance of 144 Kms, and the remaining 35% of its limestone from a distance of 181 Kms.

The BICP has assessed the capacity of the plant at 2.66 lakh tonnes of PSC (Portland Blast Furnace Slag Cement). However, due to limitation in raw mill capacity (which was not designed to grind limestone) the clinker capacity available from this plant is only 0.93 lakh tonnes per annum. The remaining clinker is,therefore, acquired from the ACC plant situated at Khalari (district Hazaribagh in Bihar). The Jaipur Udyog plant has 4 wet process kilns installed between 1953 and 1959. One of the major causes for underutilization of its capacity is power shortage.

It cannot be denied that to some extent, proper management can overcome the problems created by power shortages. For instance, in many areas the seasons of power cuts can generally be forecast, and good management practice can obviate the problems of acute power shortage by planning routine plant maintenance at such times.

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1. Sludge is a kind of mud, whereas slag is in the form of hard pellets, which have to be crushed.

TABLE 5.1

Loss of cement production due to power cuts/failures.

(1000 tonnes)

	1974	1975	1981	1982	1983	1984
1. Dwarka	5	2	7	13	6	6
2. Khalari	-	2	-	-	N[1]	N[1]
3. Lakheri	-	5	25	27	-	3
4. Sevalia	-	-	4	3	-	1
5. Sindri	15	13	4	5	4	1
6. JAIPUR	101	41	366	379	220	171
7. Churk	42	33	25	6	19	68
8. Dalla	115	43	42	13	9	84
9. Sankarnagar					343	10
10. Charkhi Dadri			-	32	9	29
11. Alangulam		80	29	62	169	2
12. Ariyalur			13	90	97	26

SOURCE: "Cement Production and Despatches" 1974,'75,'81,'82,'83,'84.

1. N – negligible

TABLE 5.2

CAPTIVE POWER AND ITS CONSUMPTION IN THE CEMENT INDUSTRY.

	Captive power consumption (KWH)			% of total consumption*		
	1978-79	1979-80	1980-81	1978-79	1979-80	1980-81
1. Jaipur Udyog	3,46,67,000	2,55,26,000	2,26,66,000	40.77	36.45	50.07
2. Churk	300	9,000	1,300	0.0006	0.022	0.003
3. Sevalia	2,66,80,000	1,86,50,000	91,70,000	100.00	82.16	60.29
4. Khalari	2,03,70,000	2,02,60,000	1,31,50,000	100.00	100.00	100.00
5. Dwarka	30,50,000	22,80,000	9,70,000	8.39	7.33	5.22
6. Bhupendra	70,000	9,10,000	10,000	0.15	2.47	0.04
7. Lakheri	3,18,50,000	2,02,50,000	1,46,80,000	90.41	89.21	72.09
8. Bagalkot Udyog Ltd.	9,000	6,000	3,000	0.039	0.052	0.026

*Total power consumption = Power consumed from S.E.B. + power consumed from own generation from captive power plant.

Source: BICP Committee Report, 1981.

Further, the High Level Committee set up by the BICP in 1981 found that in general, if a cement plant has stand-by power generation capacity for some 25-30% of its total power requirements, it can insure itself almost totally against power cuts and power shut downs.

However, as can be seen from Table 5.1, the duration of power cuts/failures faced by the Jaipur Udyog plant seem to have been exceptionally long.

Even though its captive power generation capacity has been quite high (even exceeding 50% in certain years), it has not been enough to compensate for the power cuts and failures.

The Charkhi Dadri plant was set up in 1938 in Haryana, with a single semi dry process kiln based on nearby deposits of lime Kankar in Mohindergarh district. Subsequently, one kiln was added in 1958. This was the first plant to shift away from the traditional, high fuel consuming wet process.[1]

One of the major bottle necks faced by this plant is deterioration in the quality of the Kankar, requiring the addition of sweetener to the extent of 60%. The use of sweetener adds to the cost of production. Also, due to the deterioration in the quality of the Kankar, high grade limestone now has to be purchased from Katputli in Rajasthan at a distance of 150 Kms.

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1. See NOTE on page 92-93.

NOTE: Cement can be manufactured by two methods — the Wet Process technology, which has now become obsolete due to its greater consumption of fuel, and the modern Dry Process technology, which is relatively more economical.

The rotary kiln, a huge steel cylinder, is the principal part of the cement manufacturing plant. Lined with refractory bricks and mounted on steel rollers at a slight angle, the kiln, driven by a motor, rotates slowly at about one revolution per minute.

In the wet process technology, crushed limestone, clay and water, in carefully defined proportions, are fed into grinding mills from where the mixture issues as a thick, creany substance known as 'slurry'.

The slurry is fed into the upper end of the kiln, while pulverised coal or oil is fired under high pressure into the lower end. While the slurry is in the kiln it is first dried, then calcined and finally cintered to a temparature which is maintained at about 2,700 ^{o}F. During this process, the materials undergo a complete chemical transformation. What was slurry emerges from the discharge end of the kiln as hard pellets known as "clinker".

In the dry process, limestone and clay are fed into a grinding mill into which hot air is also passed. The materials are heat-dried thoroughly and then reduced to a fine powder known as raw meal. After the raw meal has been thoroughly mixed with the aid of hot, compressed gases, it ultimately enters a short rotary kiln of conventional design to be burnt into clinker.

The clinker, whether obtained by the wet or dry process, is allowed to cool and is then fed into grinding mills where, along with a small quantity of gypsum, it is reduced to a very fine powder which we call cement.

The dry process eliminates the wasteful aspect of the wet process technology - a large amount of fuel being burnt merely to evaporate the water, and has become increasingly popular since the late 1950's.

At both Jaipur Udyog Ltd. and Charkhi Dadri, high down time on maintenance due to ageing was one of the major causes of underutilization of capacity.

In fact, in 7 out of the remaining 9 units, down time due to ageing of the plant and break-down maintenance was a major, if not the most important reason for underutilization of capacity.

While, logically speaking, one may expect to find a positive relationship between down time and the age of the plant, this does not seem to be the case when we examine the data available.

For instance, the unit at Dalla established as recently as 1972-73, and the Alangulam unit established in 1970, both show a high down time of plant and machinery due to break-down maintenance. This obviously reflects inefficient management, more than anything else!

Further, a study conducted by the BICP in 1981 finds that "as a result of better maintenance, even the down time required for plants does not show any significant correlation, with the age of the plant". (BICP Committee Report, page 77, 1981).

Again, the fact that both Dalla and Alangulam units were set up with kilns based on the obsolete, high fuel consuming, wet process technology at a time when practically the entire cement industry had decided to adopt the relatively

more efficient, lower cost, fuel-saving dry process technology, obviously indicates bad decision making.

Most of the units have attributed a very substantial proportion of underutilization of capacity to poor quality of limestone, long leads and, therefore, timely non availability of limestone and coal, and power shortages.

However, poor quality of limestone and/or its timely non availability cannot be accepted as valid excuses for underutilization of capacity. For, limestone being the most important raw material, it has been generally accepted that nearness to limestone deposits of a reasonable quality should be the main consideration in setting up of cement plants.

As far as non availability of coal and the lack of a steady supply of power are concerned, there is no doubt that these two factors do have an adverse effect on capacity utilization and, are, to some extent, beyond the control of the plant's management. But, at the same time, it is true that proper management can obviate this problem to some extent.

For instance, routine plant maintenance can be undertaken when coal stocks begin to run low, so that coal stocks can be built up while plant maintenance operations are in swing.

And, in fact, details of the average and minimum coal stocks (at any point of time) as indicated by different plants, do seem to suggest ~~that~~ that plant shut-downs due to the so-called "external" factors have been exaggerated and could have been obviated.

The 1981 BICP Committee found that while many units reported a very significant loss of production of cement due to inadequate coal supply, one particular unit was able to report zero loss of production because of coal shortage, merely by timing routine repairs and maintenance and operational shut-down to synchronise with low coal stocks.

Regarding power supply, in many areas the seasons of power cuts are generally predictable, and good management can obviate the problem of acute power shortage by planning routine plant maintenance at such times.

Many units have also attempted to either have captive power generation for their entire requirements of power or to have stand-by power generation capacity to meet the minimal requirements of power so as to avoid loss of production or damage to equipment arising from thermal shocks.

Thus, we see that sickness in the cement industry could be attributed largely to firstly, managerial inefficiency, and secondly, to inadequate investment in repairs and maintenance.

TABLE 5.3

Annual Installed Capacity of some of the Sick Units in the Cement Industry (1970-84).

(in tonnes)

Name of Co/Factory	1970	1980	1984
ACC			
1. Dwarka	340,320	340,000	276,996
2. Khalari	101,590	102,000	109,152
3. Lakheri	365,710	356,000	322,464
4. Sevalia	203,180	203,000	215,004
5. Sindri	304,760	305,000	305,004
CCI			
6. Charkhi-Dadri	-	239,000	174,000
7. Jaipur Udyog Ltd.	818,000	1000,000	990,000
Tamil Nadu Cements			
8. Alangulam	200,000	400,000	400,000
U.P.State Cement Corporation			
9. Churk	474,670	475,000	475,000

SOURCE: Data obtained from the CMA.

While the former factor could be accidental, the latter, i.e. the fact that many of these units did not even bother to carry out sufficient repairs and maintain the capacity that had initially been installed[1], could also reflect part of an overall oligopolistic strategy whereby certain units (mainly wet process ones) are deliberately allowed to suffer losses over time or fall sick, so that sickness benefits can be obtained from the government.

This view is supported by the fact that even a company like the ACC deliberately allowed some of its plants to remain sick (these were all wet process plants) when the sickness could have easily been averted/cured by modernizing the plants and converting them to dry process units.

(It is significant to note that out of the 12 sick units considered, 10 were based on the obsolete, high-cost, wet process method of manufacture. Also note that the sickness benefits received by these units from the government were not necessarily utilized within the unit. For instance, the plant at Dalla received a sickness benefit of Rs. 5.52 crores during the period 1982-83 to 1985-86, but, the study conducted by the BICP Committee in 1985 found that the unit had incurred hardly any expenditure on plant and machinery during this period).

This oligopolistic strategy would be especially relevant, given the overall context of price controls and the retention price scheme - for, here we have another example of the effects of the interaction between government intervention and oligopolistic firms.

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1. See Table 5.3.

TABLE 5.4

Factors Affecting Production 1981-84 (in 1000 tonnes)

Name of Company/Factory	Mechanical trouble (1)				Shortage of coal, raw material, power (2)				Shortage of wagons (3)			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
1. Dwarka (ACC)	3	22	3	5	112	13	7	6	6	5	-	11
2. Khalari (ACC)	3	9	5	17	-	-	N	N	-	-	-	-
3. Lakheri (ACC)	10	11	9	-	64	30	-	3	3	-	-	-
4. Sevalia (ACC)	-	9	19	6	4	3	-	1	-	-	-	-
5. Sindri (ACC)	-	-	35	-	139	107	4	120	-	N	N	-
6. Charkhi Dadri (CCI)	46	10	9	3	-	48	9		-	-	-	29
7. Sankarnagar (India Cements)	NA	NA	67	107	NA	NA	343		NA	NA	-	10
8. Jaipur Udyog Ltd. (Sawaimadhopur)	84	75	111	171	380	379	220	171	5	N	-	-
9. Ariyalur (Tamil Nadu cements)	88	47	118	124	13	90	97	27	33	-	2	8

TABLE 5.4 (contd)

	(1)				(2)				(3)			
10. Alangulam (Tamil Nadu cements)	14	10	3	11	67	62	169	20	-	-	-	-
11. Churk (U.P.State Cement Corporation)	52	235	159	138	79	6	70	76	-	-	-	-
12. Dalla (U.P.State Cement Corporation)	236	346	279	245	42	13	9	84	19	-	-	1

NOTE: N - negligible

NA- Not available

SOURCE: Data obtained from the office of the Cement Controller of India.

TABLE 5.5

Cost of Production of Cement in some of the Sick Units

Name of Co/Plant	Cost per M.T.[1] of Cement* (Rs.)		
	1982-83	1983-84	1984-85
A.C.C.			
1. Dwarka	532.67	526.54	NA
2. Khalari	454.31	499.37	NA
3. Lakheri	445.95	466.67	NA
4. Sevalia	459.82	559.67	NA
5. Sindri	422.91	478.76	NA
C.C.I.			
6. Charkhi-Dadri	439.32	437.95	481.49

* Ex - Works costs of sales excluding interest and bonus.

NA - Not available.

1 MT - Million Tonnes.

Name of Co/Plant	Cost per M.T. of Cement Rs.							
	1982-83		1983-84		1984-85			
India Cements	OPC	PPC	OPC	PPC	OPC	PPC	RSC**	
7. Sankarnagar	437	398	535	484	551	490	739	naked cement
	506	466	621	566	678	586	870	packed cement
8. Jaipur Udyog Ltd.	421.57		464.47 (OPC)					
	391.45		428.44 (PPC)					
Tamil Nadu Cement Ltd.(TANCEM)								
9. Ariyalur	368		431		535	OPC		cost for naked cemen
	434		509		675			cost with bags
	356		409		505	PPC		cost for naked cemen
	420		487		645			cost with bags

** RSC = Railway Sleeper Cement.

OPC - Ordinary Portland Cement.

PPC - Portland Pozzolana Cement.

Name of Co/Plant	Cost per M.T. of Cement Rs.				
	1982-83	1983-84	1984-85		
10. Alangulam	385	495	530	OPC	Naked cement
	448	570	657	OPC	With bags
	357	465	495	PPC	Naked cement
	420	541	622	PPC	With bags
U.P. State Cement Corporation					
11. Churk	381	456	524		Naked cement
	439	529	637		Packed
12. Dalla	482	521	613		Naked cement
	536	586	740		Packed

SOURCE: Report of the BICP Committee on Sick Units in the Cement Industry(1985).

APPENDIX TO CHAPTER 5 PART-A

TABLE 5.6

SICK UNITS

Name of Co/Plant	Capacity* (in lakh tonnes per annum)	Number of kilns	Type of process	Year of installation	Capacity utilization (%)		Reasons for sickness
(1)	(2)	(3)	(4)	(5)	(6)		(7)
ACC							
1. Dwarka	3.81	4	Wet	1933 to 1965	1981-82 1982-83 1983-84	64.00% 68.74% 67.09%	Very old age of the plant.
2. Khalari	1.09	1	Wet	1936	1981-82 1982-83 1983-84 1984-85	89.20% 94.10% 96.70% 71.80%	Age of plant, High cost of limestone because the limestone available of poor quality and the deposits are scattered.
3. Lakheri	4.12	3	Wet	1931 & 1951	1981-82 1982-83 1983-84 1984-85	75.54% 75.30% 84.01% 86.80%	Age of plant.
4. Sevalia	2.64	2	Wet	1951- 1952	1981-82 1982-83 1983-84 1984-85	83.50% 82.20% 76.20% 91.80%	The limestone needs beneficiation and would require coal of 20-22% ash content as against the available 24-26% ash content. Also, the plant is an old one.

* Capacity as estimated by the BICP Committee on Sick Units in the Cement Industry(1985).

Contd.....

(1)	(2)	(3)	(4)	(5)	(6)		(7)
5. Sindri	2.66 (of PSC at the grinding stage)	3	Wet	1955-1958			Serious raw material constraint. This plant was designed for 100% use of Calcium Carbonate sludge which was the waste product of FCI, Sindri. But sludge is now no longer available as the FCI, Sindri, has changed its process of production. The clinker required to grind the cement is 1.24 lakh tonnes, but the clinker capacity available from this plant is only 0.93 lakh tonnes per annum.
CCI							
6. Charkhi-Dadri	1.90	2	Semi-dry	1938-& 1958	1982-83 1983-84 1984-85	73.00% 84.00% 78.00%	High down time due to age of the plant; deterioration in kankar quality requiring sweetener to the extent of 60%; absence of a kankar drier; long leads in respect of limestone and coal.
India Cements							
7. Sankarnagar	8.73 (closure of 1 kiln on 1-10-83 due to ageing and deterioration in performance)	5	Wet	1949-1970	1982-83 1983-84 1984-85	62.00% 68.00% 88.00%	Low capacity utilization in the past has been due to deterioration in the performance of kilns installed in 1949 & 1956 due to ageing timely non-availability of limestone and coal.

Contd....

(1)	(2)	(3)	(4)	(5)	(6)		(7)
8. Jaipur Udyog Ltd.	7.47	4	Wet	1953-1959	1981-82	64.50%	Power shortage.
					1982-83	62.00%	High down time on maintenance due to ageing.
					1983-84	74.10%	Existing limestone quarry is depleted and a new one is being opened up.
Tamil Nadu Cements							
9. Alangulam	4.23	2	Wet	1970	1982-83	65.60%	High down time of plant and machinery due to break-down maintenance. Raw material problems, espectially timely non-availability of coal due to long lead and power cuts. Also, the limestone deposit has high over burden (overburden to ore ratio, 2.83:1) and mining is mainly manual and selected to obtain the required quality. This adds to the cost of limestone raising.
					1983-84	56.80%	
					1984-85	79.50%	
10. Ariyalur	5.14	2	Dry	1979	1982-83	48.00%	The plant has been operating at a low capacity utilization since inception due to the higher hygroscopic and clayish nature of the limestone. Down-time of the mill due to power cuts ranging from 2 to 16% during the period 1981-82 to 1984-85.
					1983-84	59.00%	
					1984-85	55.00%	

(1)	(2)	(3)	(4)	(5)	(6)		(7)
U.P.State Cement Corporation							
11. Churk	4.80 (for cement)	4	Wet	2 in 1954 2 in 1962	1982-83 1983-84 1984-85	48.00% 44.00% 39.00%	Lower capacity utilization for cement because the plant is grinding only part of the clinker produced and nearly 54% of the clinker is transferred to the company's grinding unit at Chunar to make PSC.
	3.82 (for clinker)				1982-83 1983-84 1984-85	89.00% 80.00% 73.00%	Low capacity utilization for clinker was mainly due to high stoppage hours on break-down maintenance and deterioration of production rate due to age of plant. Also, high stoppage hours due to power cuts particularly in 1984-85 (to the extent of 12%).
12. Dalla	4.00 LTPA for cement & 3.56 LTPA for clinker	2	Wet	1972-1973	Cement 1982-83 1983-84 1984-85 Clinker 1982-83 1983-84 1984-85	11.00% 21.00% 20.00% 80.00% 65.00% 53.00%	The plant is grinding only part of the clinker in its own cement mills, about 70% being sent to the Company's Chunar grinding plant. Reasons for under-utilization of kiln capacity are mainly down-time due to maintenance and shortage of raw materials. NOTE: This unit received sickness benefit of about Rs. 5.52 crores during the period 1982-83 to 1985-86, but the company incurred no substantial capital expenditure on plant and machinery during this period.

SOURCE: Report of the BICP Committee on Sick Units in the Cement Industry (1985).

APPENDIX TO CHAPTER 5 PART-B

(1) DWARKA (ACC)

This plant had received a sickness benefit of Rs. 4.8 crores between 1981-82 and 1983-84, and spent Rs. 4.69 crores on modernization and replacement schemes.

This is one of the very few sick units whose proposed investment programme for the period 1985-86 to 1989-90 would actually lead an increase in cement production (by 1.67 lakh tonnes per annum).

(2) KHALARI (ACC)

Reasons for sickness -

(a) Age of the plant

(b) High cost of limestone. The limestone available is of poor quality, and has to be enriched by beneficiation through the flotation process, due to which the average consumption of limestone per tonne of clinker is about 2.54 tonnes, against the normal consumption of about 1.6 tonnes per tonne of clinker. Also, the limestone deposits are scattered, and the raising of limestone is entirely manual.

Comments:

Since limestone is the most important raw material, and constitutes the largest single element of cost, nearness to limestone deposits is generally the main consideration in setting up of cement plants and so, if the quality of the limestone available is not good enough, or the cost of raising limestone is high because the deposits are scattered, then this obviously reflects inefficient planning more than any thing else, because the quality of the limestone available and the cost of raising it should have been taken into account in deciding where to set up the plant.

The 1984 BICP Committee on sick units also noted that although this unit had received a sickness benefit of Rs. 1.90 crores during the period 1982-82 to 1983-84, no major scheme had been taken up for modernization of the plant.

(3) LAKHERI (ACC)

This plant had received a sickness benefit of about Rs. 5.08 crores during the period 1981-82 to 1983-84, and has spent about Rs. 4.75 crores on major repairs and rehabilitation, which resulted in a ~~study~~ steady improvement in capacity utilization.

(4) SEVALIA (ACC)

The main reasons for the sickness of this plant are firstly, that the limestone (brought from a lead of 12 Kms.) needs beneficiation and would require coal of 20% to 22% ash content, as against the actual availability of coal with 24% to 26% ash content and secondly, the age of the plant. Here again, as in the case of the plant at Khalari, the inappropriate quality of the limestone reflects very poor decision making more than anything else.

(5) SINDRI (ACC)

As has been discussed earlier in this chapter, this plant seems to have a genuine reason for being 'sick', as it was designed for 100% use of Calcium Carbonate sludge as a source of limestone, which was a waste product of the FCI's fertilizer plant located at Sindri, and the sludge was no longer available, the FCI having changed its process of production.

(6) CHARKHI-DADRI (CCI)

This plant had attributed its sickness to high down-time due to the age of the plant, deterioration in the quality of the kankar available and long leads in respect of limestone and coal which contributed to the higher cost of production.

As far as the decline in the quality of the kankar available was concerned, this was a genuine constraint beyond the control of the management of the plant. For, the deterioration in kankar quality required the addition of sweetener to the extent of 60%, and the sweetening process had not yet been stabilized, affecting nodule formation and consequently the kiln feed and the rate of production. The absence of a kankar drier also affected the rate of production.

(7) SANKARNAGAR (INDIA CEMENTS)

Low capacity utilization of this plant in the past has been attributed mainly to deterioration in the performance of the kilns installed in 1949 and 1956 due to ageing, and timely non-availability of limestone (more than 60% of its requirements are purchased) and coal (long lead distance of 1800 Kms.) and high fuel consumption due to the wet process of production.

Here again, timely non-availability of limestone is not a genuine bottleneck. This problem can be easily sorted out through better management. And, if fuel consumption is high because of the wet process of production, then the plant should have undertaken a modernization programme to convert the production process to a dry one, as so many other units have done.

It is interesting to note that this company received a sickness benefit of Rs. 12.22 crores from 1981-82 to November 1984. As against this benefit, the investment expenditure on modernization, replacements, etc. during 1981-82 to 1984-85 was only Rs. 2.62 crores and that, too, only on miscellaneous replacements of plant and machinery to simply maintain the production level. Its investment plans for 1985-86 to 1989-90 involve an investment expenditure of Rs. 20.35 crores — mainly on replacement of machinery — to ~~only~~ merely maintain the current level of production.

(8) JAIPUR UDYOG LTD.

This plant has been sick almost continuously ever since its inception in 1953, despite the fact that it gets 95.5% of its limestone from its own quarry.

The BICP Committee of 1984 found that its future programme of investment for the period 1985-86 to 1989-90 involved only replacements to maintain the level of production and would not result in any increase in the capacity of the plant.

However, as has been pointed out earlier in this chapter, this plant does seem to have a genuine problem in that the power cuts faced by it have been exceptionally high. Refer to Table 5.1.

(9) ALANGULAM (TAMIL NADU CEMENT CORPORATION)

This plant has 2 wet process kilns installed in 1970, and attributed its low level of capacity utilization mainly to a high down time of the plant and machinery due to break-down maintenance.

But, firstly, if the plant was installed as recently as 1970, by which time almost all the cement companies had adopted the dry process of production for at least the new plants (if not the older ones), then the installation of a wet process plant was obviously a bad decision.

And, secondly, a plant which had been installed as recently as 1970 should not be suffering from such frequent

break-downs. It obviously implies that the maintenance was inefficient.

(10) ARIYALUR (TAMIL NADU CEMENT CORPORATION)

This plant has two dry process kilns installed in 1979. Its low capacity utilization was attributed to the very high moisture content of limestone.

Again, since nearness to limestone deposits is the main consideration in setting up of cement plants, and if the quality of limestone is inappropriate, then obviously this implies inefficient decision makding because, the quality of the limestone available should have been taken into account in deciding where to set up the plant.

Again, between 1982-83 and 1984-85 the company has spent Rs. 2.50 crores (as against the sickness benefit of Rs. 2.13 crores received during 1984-85 only), on this plant towards miscellaneous replacements of plant and equipment, and minor improvements to plant and quarry development. But, the major problem of moisture in the limestone available remains unsolved and is adversely affecting the plant's operations.

(11) CHURK (U.P.STATE CEMENT CORPORATION)

This is a wet process plant with four kilns, two of which were installed in 1954 and the other two in 1962.

The capacity utilization of this plant declined from a low level of 48% in 1982-83 to an even lower level of 44% in 1983-84, and further to 39% in 1984-85, because the plant was grinding only part of the clinker produced, and nearly 54% of the clinker was being transferred to the company's grinding unit at Chunar to make PSC (Portland Slag Cement).

The down-time due to break-down maintenance was very high because of the age of the plant. This plant had also faced a lot of power cuts since 1984-85.

However, the company has initiated a programme to completely modernize the plant. It proposes to scrap all the wet process kilns and replace them with a single dry kiln of 1500 TPD. The BICP Committee (1984) estimated that continuation of the sickness benefit for three years would enable the company to achieve its plans for modernization.

(12) DALLA (U.P. STATE CEMENT CORPORATION)

This plant has two wet process kilns installed in 1972-73. Here again, the installation of wet process units at a time when the rest of the cement industry had switched over to the modern dry process technology was obviously a reflection of poor decision making.

Its capacity utilization was 11% in 1982-83, 21% in 1983-84 and 20% in 1984-85, because the plant was grinding only part of the clinker in its own cement mills, about 70% being sent to the company's Chunar grinding plant.

The reasons given for underutilization of its kiln capacity were mainly down-time due to maintenance and shortage of raw materials. However, the plant's age (13 years) cannot fully explain the excessive down-time.

(The company has not furnished complete details against the BICP questionnaire).

The unit had received a sickness benefit of about Rs. 5.52 crores during 1982-83 to 1985-86, but during this period the company had not incurred any substantial capital expenditure on plant and machinery. However, it was found that in view of the plant's modernization programme which is likely to cost substantially, sickness benefit for three

more years would see this plant through, by which time its plans for modernization were expected to be decided upon and initiated.

CHAPTER-6

CONCLUSION

We have seen that by the 1930's economists had realized that oligopoly i.e. domination of the market by a few large, strategically interdependent firms was a situation more likely to occur than monopoly. The market concentration typical of oligopoly was likely to arise/be enhanced by the existence of economies of scale in production and marketing and the natural existence of or deliberate creation of barriers to entry - such as excess capacity, product differentiation, etc.

The market power of individual firms under oligopoly implies that price theory loses a great deal of the simplicity and determinateness which it possesses in dealing with perfectly competitive markets, where impersonal market forces are the most powerful factor. Situations of economic warfare, aggressive price policies, non-price competition, etc. can only be tackled within a frame work of game theory.

Unlike monopoly, where security against competitors is implicit in the definition itself, and perfect competition, where the individual competitor is powerless to safe-guard his position, the desire for secure profits should be given as much importance as the profit maximization

motive in attempting to predict/understand the behaviour of oligopolists, especially in view of the fact that the two objectives may often be conflicting.

Prices under oligopoly tend to be more or less rigidly maintained, since the price-cost margin is arrived at by the oligopolists after such a great deal of careful planning — prices must be low enough to deter potential entrants, yet high enough to not provoke price-cutting by competitors, low enough to maintain the loyalty of the customers, yet high enough to cover costs. Adjustments to changes in the external environment, particularly demand and costs, therefore, tend to be made through changes in the quality of the product, credit and discount facilities offered, salesmanship, etc, as far as possible, rather than through price changes.

The typical firm under oligopoly would tend to be of a larger than "optimum" size — because a larger size denotes greater strength in terms of the ability to survive price wars, and would tend to re-invest a larger proportion of its profits within the firm even in the event of higher yields being obtainable elsewhere, as compared to firms operating in any other kind of market structure. The firm would also tend to incur a larger expenditure on advertising and is more likely to go in for a higher degree of vertical

integration or, at least, interlocking of directorates and shareholdings.

To reiterate, the behavioural pattern of a firm operating under oligopoly is dictated by not only the profit maximization motive, but also by the anticipated future behaviour of its rival firms — normally by the desire to avoid provoking a price war, but, also at times, by a deliberate or even a sub-consious desire to provoke one.

Again, we saw in the first chapter how, unlike monopoly and perfect competition, oligopolistic industries are characterised by barriers to entry — which may be in the form of economies of scale in production and marketing, absolute cost advantage of already established firms, product differentiation and legal barriers to entry imposed by the law for various reasons. Economies of scale in production imply a larger initial expenditure and greater risk (particularly if the elasticity of demand is low) for potential entrants to the industry... Economies of scale may be either "real" — in the form of technical, managerial or labour economies, or "pecuniary" — when purchase of inputs in bulk can lower the prices at which they are available or when higher levels of production lead to lower advertising and/or lower transport costs per unit of output.

The absolute cost advantage possessed by firms already established in the industry may impose a very strong barrier to entry if the potential entrant is a relatively new firm — the older firms may have accquired knowledge of superior production techniques through past experience, and may even possess patent rights over them, may have obtained control over particular inputs required for production, may have easier access to funds — both internal and external, and may be able to operate at lower costs due to vertical integration of the production process. But, of course, as has been pointed out earlier, a completely new firm entering an oligopolistic industry would also possess a definite advantage over existing firms, in terms of being able to plan its plant 'de novo' (from scratch) and adopt the most up-to-date methods of production, and being absolutely free to choose the location of its plant and its distribution channels.

Finally, we saw that the most important barrier to entry is that of product differentiation, because buyers develop preferences for particular existing brands of the good in question, and to entice them away, the new firm must either be extremely innovative in which case the very existence of product differentiation can act as an encouragement, rather than a deternant to entry, or extremely efficient — so that it can offer the product at significantly lower prices than existing firms.

Proceeding, then, to investment decisions, we saw that while the volume of net investment that a firm would like to undertake in the form of net addition to installed capacity would depend on the projected level of future demand relative to its current capacity (of which some idea can be obtained from the current level of capacity utilization provided there is no constraint on the supply side), as well as technical considerations such as economies of scale, the amount of gross and net investment it can actually undertake would also depend on its ability to generate investment funds — from both internal and external sources.

In the Indian context, the theory of oligopoly as originally formulated, would have to be modified slightly, because in India, as in Japan and South Korea, individual units in oligopolistic industries are very often only part of a large business house, for instance, the Tatas, Birlas, etc.

The theory of oligopoly had been formulated on the assumption that prices are allowed to be determined by the free market forces, whereas in the Indian cement industry, prices and distribution were completely controlled by the government (except from January 1966 to January 1968) until December 1982, and partially controlled after that. Despite the regime of price and distribution controls, however, we see that most of the predictions made by economic theory regarding the behaviour of firms in an oligopolistic industry — such as the maintenance of excess capacity, product differentiation, extensive advertising expenditure, and collusion between firms did hold good for the

Indian cement industry. Price wars among the cement manufacturers in the 1920's led to the formation of the Cement Marketing Company of India in 1930, to promote the sale and distribution of cement at regulated prices. In 1936, 11 out of the 12 existing companies merged together to form the Associated Cement Companies (ACC), which now consists of over 18 companies.

When the Dalmia - Jain group entered the field in 1937, and a price war broke out again, this time between the ACC and the Dalmia-Jain group, the two companies eventually set up a joint selling organisation which would fix prices, and distribute total sales betwen the two companies on a mutually agreed basis.

In 1961, the Cement Manufacturers' Association (CMA) was set up "to encourage friendly co-operation and unanimity among cement producers".[1] When the price and distribution of cement were decontrolled for two years - from January 1, 1966 to January 1,1968 the cement manufacturers set up the Cement Allocation and Co-ordinating Organization (CACO) to "regulate" the prices and distribution of cement. The decontrol of cement in February 1982, was not a replacement of government control by that of the market but, rather, replacement by the organized monopolistic collusive power of the cement manufacturers in the form of the Cement Manufacturers' Association which took over the function of "monitoring" the prices and distribution of cement.

1. "The Cement Industry in India 1914-1964" published by the Cement Manufacturers' Association in 1964.

In the chapter on price controls, it was contended that fixing of prices on a 'cost-plus' basis in a market which was not exposed to foreign competition encouraged inefficiency, in the sense that producers had no incentive to lower costs, because that would mean a reduction in the controlled price and not a better return to them. Also, that the policy of dual pricing along with partial decontrol adopted in February 1982 encouraged the tendency towards cartelization. Instead of permitting the free sale of an increasingly larger part of the total output of an essential commodity (being produced by an oligopolistic industry) which was already in short supply, it would have been wiser for the government to adopt a system of dual pricing where the State would provide a reasonable profit margin to producers, while simultaneously trying to protect the more vulnerable sections of society or the priority sectors of the economy against an excessive rise in prices, for instance, by providing subsidies to certain groups.

The partial decontrol of cement in 1982 was <u>not</u> a replacement of government control by the free forces of the market but rather, the replacement of one price regulating agency (the State) by another in the form of the Cement Manufacturers' Association, and it is rather unfortunate that the monopolistic collusion of the cement manufacturers in such an organized manner should have taken place with the sanction and, apparently, approval of the government.

In the chapter on "Capacity Utilization and Investment Behaviour" we saw how the very concept of "Capacity" can be interpreted in various different ways, depending on which definition of capacity we choose to adopt. Accordingly, one can obtain various different estimates of capacity utilization, depending on how we choose to measure capacity. Ideally speaking, the capacity of a plant should be measured in terms of its "attainable" capacity, i.e., the output which it can produce given the quality of raw materials and availability of infrastructural facilities, the normal duration of time required for routine repairs and maintenance, the number of shifts normally worked, the length of each shift and the number of working days per year.

Since cement is a continuous process industry, we have chosen to measure the attainable capacity assuming three eight-hourly shifts a day, with 330 working days per year, allowing for a provision of a down-time of 35 days a year for normal maintenance work. This is in consonance with various studies conducted by the BICP.

In that chapter, an attempt was made to offer an explanation for the downward trend in the capacity utilization ratio of the cement industry as a whole and of the observed

inter-firm differences in the level of capacity utilization.

We saw that, although the level of capacity utilization declined from an average of above 90% during the 1950's to a level of 85% to 90% during the 1960's and has since then been consistently below the level of 85% recommend by the BICP in its various studies, being only 71.5% for the period 1980 to 1984, the level of installed capacity increased considerably during the entire period.

The increase in installed capacity was not only due to the entry of new firms into the industry, but also due to a considerable expansion of capacity by some of the existing firms. For instance, the Cement Corporation of India, which was established in 1970, had expanded its capacity to 34 times the initial level by 1984.

If the unutilized capacity could be attributed entirely to low profitability and a shortage of raw materials and infra-structural facilities as has been repeatedly claimed by the cement manufacturers then, it was asked, how would one account for - firstly, the entry of so many new firms into the industry which, logically speaking, should have, therefore, invested their funds in more profitable industries, for virtually all these firms were ones for whom cement was a major, if not the primary product, and, secondly, the expansion of capacity by existing firms, who ought to have been aware of the scarcity of raw materials and infra-structural facilities.

If the excess capacity was neither due to supply nor due to demand constraints, then it was obviously being maintained deliberately. This was partly to deter entry, but mainly, it is contended that the continuous expansion of capacity simultaneously with an almost steady increase in the level of underutilized capacity available reflected a policy of deliberately maintaining excess capacity in a situation of excess demand in order to pressurise the government (through social and political pressure and by pushing up the average fixed cost — since retention prices in the cement industry were fixed on a 'cost plus' basis) to adopt a more liberal and more profitable policy towards the cement industry. This view was supported by the graph showing the relationship between profitability and capacity installed/utilized which showed that while capacity installed showed a very definite positive relationship with profitability, with a time lag of one year, the level of capacity utilized displayed absolutely no relationship to profitability.

Furthermore, in Table 4.7 it was shown that if firms are grouped together according to size, the highest level of under-utilized capacity (amounting to an average of almost 27.50%) was maintained by the firms in the largest size group, i.e., above 800 tonnes.

In the chapter on sick units we saw that sickness was mainly due to managerial inefficiency as well as the lack of any gross (let alone net) investment in certain units. (This in

turn, could be associated with overall oligopolistic strategies which go beyond unit-specific considerations).

In the ultimate analysis we see, therefore, that even within a regime of price and distribution controls, the objectives pursued by the leading firms in the Indian cement industry have been more or less in consonance with those predicted by oligopoly theory, though the means used to achieve these objectives may have been different.

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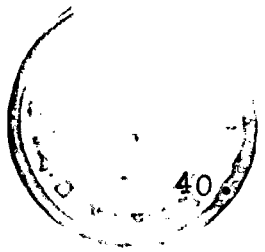

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