

CEMENT INDUSTRY IN INDIA: SOME ASPECTS

**A DISSERTATION
SUBMITTED TO THE
UNIVERSITY OF POONA
IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE DEGREE OF
MASTER OF PHILOSOPHY
(IN ECONOMICS)**

**BY
KIRAN SAWHNEY**

**GOKHALE INSTITUTE OF POLITICS AND ECONOMICS,
PUNE 411 004**

DECEMBER 1983

ACKNOWLEDGEMENTS

I would like to thank my guide, Prof. V.S. Patvardhan, for the valuable time he gave me. My sincere appreciation also to Prof. P. Venkatramaiah and Prof. B.S.R. Rao for their advice.

I owe a debt of gratitude to Mr. S.S. Ambardekar and Mr. Jacob for turning an illegible manuscript into a presentable dissertation. It remains only for me to thank my family for having made this venture at all possible.

I would like to mention also that I am solely responsible for the views expressed in this work.

December 1983

Kiran Sawhney

C O N T E N T S

	<u>Page</u>
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	iv
 <u>CHAPTER</u>	
I THE CEMENT INDUSTRY	1
II THE INDUSTRY AND PRICE REGULATIONS	8
III CAPACITY UTILISATION, PRODUCTIVITY AND BARRIERS TO ENTRY	48
IV A FINANCIAL OVERVIEW	76
V ACC AND CCI - A COMPARISON	100
VI CONCLUSIONS	122
 BIBLIOGRAPHY	 125

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1.1	Cement and Five Year Plans	4
2.1	Total installed capacity and production	13
2.2	Uniform pricing system	27
2.3	3-tier pricing system	29
2.4	Ex-works prices and the Demand-Supply gap	32
2.5	Cost structure (as % of value of production) of cement companies	35
2.6	Composition of works cost estimated in successive Tariff Commissions and High Level Committees	40
2.7	Consumption per tonne of clinker (1978)	42
2.8	Excise duty component	42
2.9	Age pattern of units (as at the time of various Tariff Commissions)	44
2.10	Size of plants	45
2.11	Regionwise distribution of production and consumption of cement	46
3.1	Trends in capacity utilisation	51
3.2	Reasons for shortfall in production	52
3.3	Capacity utilisation - Regionwise	55
3.4	Capacity utilisation (%) according to age of factories	58
3.5	Capacity utilisation (%) according to size	60

<u>Table</u>	<u>Page</u>	
3.6	Capacity utilisation according to process	61
3.7	Unit capacity in tonnes per day (tpd)	62
3.8	Ownership pattern (Percentage to total)	65
3.9	Capacity utilisation according to management	66
3.10	Average C/O ratio at 1960-61 prices	68
3.11	Capital intensity indices in cement 1961=100	69
3.12	Cost conditions of cement companies	72
4.1	Average growth rates (% per annum)	80
4.2	Net capital between 1965 and 1970	81
4.3	Ratios of dividend payments (average for the 5 year periods)	89
4.4	Averages of profit ratios for 5 year periods	93
4.5	Average ratios for 5 year periods	97
4.6	Capital efficiency (average for the five year period)	98
5.1	Capacity utilisation	106-a
5.2	Costs per tonne of cement	107
5.3	Fixed assets per tonne of installed capacity	108
5.4	Cost of raw materials per tonne of cement	109
5.5	Cost of raw materials	110

<u>Table</u>		<u>Page</u>
5.6	Some indicators of operations	111
5.7	Profitability ratios (%)	113
5.8A	ACC : Cost as percentage of earnings	114
5.8B	CGI : Cost as percentage of earnings	114
5.9	Borrowings position of ACC and CGI	116
5.10	Debt:Equity ratios	117
5.11	Net sales:net fixed assets (%)	118
5.12	Inventory:sales (%)	120

CHAPTER I

THE CEMENT INDUSTRY

In a layman's parlance, cement is "an adhesive substance used for binding". It is probably also one of the few definitions not complicated by the technocrat. Cement is used almost exclusively in the construction business in the form of mortar or concrete. Both these are mixtures of cement powder and sand in various proportions. Cement itself is a fine grey dust-like powder which emerges at the end of one of two processes: Wet and Dry.

Wet Process

In the wet process, crushed limestone, clay and water are fed into grinding mills where the mixture is converted into "slurry". The slurry is then stored in silos where it is "corrected" to the right composition and fed into the upper end of a kiln while pulverised coal and oil are fired under pressure into the lower. It is then dried and calcined in the kiln and finally subjected to a temperature of 2700°F. The resulting discharge is in the form of hard dark pellets called "clinker".

Dry Process

In this process, limestone and clay are fed into a

grinding mill where they are heated, dried and reduced to a fine powder called "raw meal". This is mixed with water to form "nodules" which are fed into a moving grate through which hot gases from the rotary kiln are passed; here they are dried and partially calcined. The calcined nodules are passed into a short rotary kiln where they are burnt to form clinker.

The clinker obtained from either process is allowed to cool and then fed into grinding mills where, along with a small quantity of gypsum, it is reduced to a fine powder - cement. The gypsum controls the setting time. Of the two methods, the dry process is the favoured process although it requires more fixed initial capital investment. The wet process is more fuel consuming, though more economical on power and also releases less dust.

The two main types of cement that are produced are the Pozzolona Portland Cement (PPC) and the Ordinary Portland Cement (OPC). Some cement units have also been set up to manufacture slag cement or fly ash cement. These are cements made from the waste of steel and power plants.

A peculiarity of the cement industry is its location pattern. In a study,¹ some factors have been isolated

1 Kirit Patel and G.S. Gupta, "Location of the Indian Cement Industry", Vikalpa, October, 1976.

as the basis for the existing location of the industry. Also, strangely enough, the regionwise share of output is inconsistent with most of the determinants of location, including the criteria of demand and supply of raw materials and the production cost. This suggests that the location was not optimum. There has, however, been a tendency towards more dispersion of the cement producing units. The metamorphosis of the industry has not been a natural one and the government has played not a negligible part in it.

The post-independence years gave a new impetus to the cement industry, because, suddenly, contrary to the previous situation of excess supply, the economy faced an increasing shortage in the supply of cement. In 1947, the industry consisted of 18 units with the actual production of about 1.5 million tonnes of cement per year.

In 1951, for the first time, targets of cement production were planned as a part of the Five Year Plans. During the First Five Year Plan (1951-56), cement production increased from 2.69 million tonnes to 4.60 million tonnes. Targeted installed capacity however was not attained and production was lower than targets by only 4 per cent.

Table 1.1 : Cement and Five Year Plans

(in Tmn. tonnes)

Five Year/ Annual Plans	Capacity		Production	
	Target	Achieve- ment	Target	Achieve- ment
1950-51	3.28	-	2.20	-
1951-56	5.31	5.02	4.80	4.60
1956-61	16.00	9.30	13.00	7.97
1961-66	15.00	12.00	13.00	10.82
1969-74	-	19.76	18.00	14.66
1974-79	23.50	22.58	20.80	19.42
1979-80	-	24.29	-	17.62
1980-81	27.59	26.24	20.00	18.55

Source : ACC "Data on Cement Industry", p.19.

The average rate of growth of capacity over the First Five Year Plan was 10.6 per cent per annum. The production, however, grew at an average rate of 11.2 per cent per annum. By the end of the First Plan, there were 27 units with a capacity of about 5 mn tonnes. The Second Plan period witnessed further expansion of the industry. By 1961, the installed capacity reached 9.3 mn tonnes - almost double that before the Second Plan Period. The targeted installed capacity was fulfilled only to the extent

of 58 per cent and the production only to the extent of 61 per cent. The number of units grew to 34 over this period. The growth rate of production per annum was only 7.2 per cent during the Second Plan period, and capacity increased at a rate of 5.8 per cent per annum.

The Third Plan targets were left unachieved to the extent of almost 20 per cent.

For the three years until the next plan there were no targets for cement and production in 1969 was 13.62 mn tonnes with a capacity of 15.60 mn tonnes. By the end of the Fourth Five Year Plan (i.e. in 1974) the installed capacity was 19.76 million tonnes and production, 14.7 ^{mn.t} per cent lower than the targeted figure of 18.00 mn tonnes. The number of units had increased to 51, but the rate of growth of production was very low - 1.5 per cent per annum. The uniform retention price introduced in 1974 aggravated the squeeze on the industry and this, coupled with inflation prevented the industry from even being able to make use of the soft loans offered by the financial institutions for expansion and modernisation. The industry was also given "priority" status to try and retrieve the situation. During 1974-76, the government introduced several measures of economy and the axe fell squarely on construction activity. Many ongoing projects in the public sector were shelved, which alone consumed 50-60 per cent of the

output of the industry. Thus stocks started accumulating and demand was on the decline again. In 1974, 15 out of 24 companies did not declare dividends. In fact, right upto 1977 (when 10 companies did not declare dividends), the industry was in a tight spot for liquidity. On the recommendations of the Tandon Committee, to make matters worse, the government introduced stringent restrictions on bank credit to the industry.

During the Fifth Five Year Plan, however, the targeted capacity was 23.50 mn tonnes and production 20.80 mn tonnes. Both were almost fulfilled and by 1979, there were 59 units in production.

The 1980-81 targets were higher at 27.59 mn tonnes for installed capacity and 20.00 mn tonnes for production. In 1980-81, the production was 18.55 mn tonnes.

The cement industry has been under the control of the government ever since independence and these are discussed in the following chapter.

Upto 1977-78, India was an exporter of cement, but thereafter, the acute shortage of the product led the government to ban all exports. In fact, in 1980-81, India imported 1.97 million tonnes of cement. Also, the government subsidised imports by waiving the customs/auxiliary/

countervailing duties and also withdrew the rebate of Rs.10 to the government departments.²

The world position of India as a cement producer is higher than that of the United Kingdom. The USSR, in 1977, produced 127.0 million tonnes of cement, the U.S.A. 67.3 million tonnes, India 19.1 million tonnes and the U.K. 16.1 million tonnes.

In the following chapters we shall examine some of the various aspects of the industry. Chapter II deals with its position in the last 30 odd years in relation to price control and other government policies.

Chapter III discusses the questions of productivity and capacity utilisation in cement; Chapter IV examines the sources and uses of finance. In Chapter V we consider the performance of two large companies: Associated Cement Company (ACC) and the Cement Corporation of India (CCI). Different characteristics of both have been juxtaposed in order to see the different modes of operation, etc. in the public and private sectors. The final chapter, Chapter VI deals with the conclusions.

² Report of the Tariff Commission, 1974, p. 51.

CHAPTER II

THE INDUSTRY AND PRICE REGULATION

Core industries like cement, coal and iron and steel have historically been the target of government control and interference. This could be attributed to the significance of these in the development of the economy. As we shall see in the chapter that follows, cement has certainly been no exception. We shall attempt to trace the course of these controls in a chronological sequence and then analyse their effects both desired and otherwise on the industry.

The cement industry has been subjected to frequent examinations by the Tariff Commission during post-independence days. First in 1953, then in 1958, 1961 and 1974. Control on cement prices in India actually dates back to 1926 when the Cement Manufacturers Association protected the industry from foreign competition. However, a system of Government regulated pricing and distribution of cement was introduced only in 1942 when wartime problems threatened to raise prices unreasonably. Thereafter, when the planning period started in the early fifties, pricing and distribution of cement were controlled as it was a basic construction material.

Price fixation in the cement industry aimed at securing fair prices for the consumer and at the same time, striving to ensure that producers produce profitably. Price fixation also had to ensure that the requisite capital continued to flow into the industry. This is so that production kept pace with demand for cement, which, unfortunately has not been possible.

These objectives have, however, inherent inconsistencies, because a fair price for the producer may not always be within the reach of the consumer. Also, within the industry there are firms which have very different cost conditions. The administered price cannot be merely based on the lowest or the highest cost units since there would be uneven gains or losses in either case. The cement industry typifies this situation because of the variations in location, scale of operations, technologies of plants, and ownerships of the firms. Consumption of raw materials also varies drastically from plant to plant, e.g. the consumption of coal per tonne of clinker produced in 1978, ranged from 191 kgs. to 448 kgs. The use of power at the same time was between 88 kwh and 180 kwh per tonne of clinker.¹

¹ According to Dr. A.K. Ghosh's estimates in the report submitted by him in 1981 as head of the Cement Controls and Price Review Committee.

There is also the problem of providing a fair rate of return on the investment in the concern. In this regard, the basis chosen has changed under the 4 Tariff Commission enquiries from Gross Block to Capital Employed to Net Worth. Gross Block, being the Gross Fixed Assets (inclusive of depreciation). Capital Employed, included the Net Fixed Assets and the working capital needed to run the business. The Net Worth comprised general reserves and paid-up capital.

Whether to fix a uniform price or a differential one has been another point discussed by the Commissions. There are arguments for and against the policy of uniform pricing. "The fixing of individual retention prices would tend to bring about stagnation and a sense of complacency in the producers as it would remove the element of competition between them to reduce their cost of production, improve their operative efficiency and raise output... individual retention prices would help the inefficient units but would not reward the efficient ones."²

These questions, i.e. the basis for return to the industry, the types of prices and their components, were the subject of the discussions by various committees appointed to examine the industry and the results have been

² Report of the Tariff Commission, 1974, Government of India, p. 15.

hotly debated.

The price that was sought to be monitored was the retention price of cement. This is the price paid to the manufacturer for non-packed or naked cement. Moreover, since cement is necessarily produced close to the location of its raw material, viz. limestone, the distribution of cement to consumer outlets situated far away has necessitated a control on freight.

The f.o.r. price comprises the retention price, the central excise duty, packaging costs and the uniform freight charge.

The retail selling price includes the f.o.r. price and central sales tax, plus State sales tax, plus octroi, plus incidental expenditure, plus stockists profit, plus transport costs (which are fixed by the State).

Each individual component of the price was fixed by the Government so that the f.o.r. destination price was uniform for the entire country. Recommendations for any escalations in the price were made by the various Commissions and these were left to the Government to either implement or reject.

Tariff Commission, 1953

Let us take first the report of the 1953 Commission. During 1952-53, the situation of the cement industry was fairly comfortable. In fact in 1954-55, the capacity utilisation of the industry was 96 per cent. There were 23 factories, of which 11 belonged to ACC, 10 were independently owned and one was a subsidiary of ACC. One was owned by the Government of Mysore. Total installed capacity was 4 million tonnes (the metric "tonne" was not used until 1960). The regional distribution also was not very even as important consuming areas like Assam, U.P. and Bengal do not produce any cement.

For ACC, the method followed was to ascertain the works cost of cement for each of the costed factories for the year ended 31st July, 1952 and to work out the weighted average cost for all factories. To the weighted average cost was added cost towards depreciation, administrative expenses, selling and distribution charges and railway freight at a flat average rate for all ACC factories. The depreciation allowance was calculated on a written down value basis.

Five high cost factories were identified and except for those, the Commission recommended a basic price of Rs.72.00 for the industry. A return of 10 per cent on Gross Block was recommended.

Table 2.1 : Total installed capacity and production

	Installed capacity (Mn.tons)	Actual production (Mn. tons)		
		1950	1951	1952
Associated Cement Cos.	2.13	1.53	1.72	1.81
Patiala Cement Cos.	0.30	0.20	0.24	0.26
Other factories	1.57	0.83	1.20	1.45
	4.00	2.56	3.16	3.52

Source : Tariff Commission, 1953.

Gross Block is the Gross Fixed Assets of the firm. The Government however implemented a return of 8 per cent.

For high cost units, an extra price per ton was recommended (Rs.5.00 for Mysore Iron and Rs.8.00 for 4 others i.e. India Cements, Orissa Cements, Digvijay and Travancore Cements). The Government implemented this proposal without any adjustments.

The recommendation of a Rehabilitation Allowance was a peculiar feature characteristic of the cement prices and is one that has been carried through to the later examinations of the industry. The Government allowed 7 units (which had been established before 1949) to add Rs.4.00 per ton to their selling prices as allowance for

rehabilitation provided they agree to hold Rs.2.00 per ton in a separate fund to be operated by them (with the consent of the Government) exclusively for rehabilitation purposes.

The packing charges for cement were fixed by the Government every quarter on the basis of the average of the minimum and maximum market price for packing material during each week of the immediately preceding months.

The recommendations came into force in 1954.

Also, from February, 1954, an excise duty of Rs.5.00 per ton was levied by the Government. This was increased to Rs.20.00 per ton in 1957. Table 2.8 shows the movement of the excise duty component over the period.

With effect from 1st July, 1956, the State Trading Corporation took over the distribution of cement under the provisions of Cement Control Order, 1956, "for the purpose of securing equitable distribution and availability of cement, indigenous as well as imported, at fair prices."³ On 1st July, 1956, a uniform selling price of Rs.102.80 per ton f.o.r. destination for packed cement was fixed by the STC. This rose to Rs.117.50 per ton on 16th May, 1957 as a result of the increase in excise duty. Profits

³ Report of the Tariff Commission, 1958, Government of India, p. 3.

accruing to STC went to cover:

- (a) Import surcharge
- (b) Contingencies
- (c) Administration expenses.

The Corporation retained a fee of 1-1/4 per cent of the gross value of turnover.

Second Tariff Commission, 1958

By the time the second Tariff Commission had come into existence, the cement industry had taken on a new appearance. In 1958, there were 28 factories - 13 owned by ACC, 2 by State Governments and 13 by others in the private sector. Most units had been able to accumulate sizeable profits in the three years following the price fixation by the 1953 Tariff Commission. This was because, firstly, Rs.15.00 allowance for freight was far in excess of what the units really required. In the matter of packing charges also, the companies were allowed to recover some part of the costs at certain rates (fixed by the Government every quarter) from the consumers. In these two ways, almost all companies were able to secure financial benefits ranging from Re.1.00 to Rs.2.00 per ton of cement.

However this cost advantage lasted only for a short while. In 1957, costs of production went skyrocketing.

Royalty rates for limestone, price of coal, inward freight on coal and raw materials, costs of stores and spares and of labour all went up.

The 1958 Tariff Commission did not fix f.o.r. destination prices but the ex-works price. This modification was made, because with the appearance of the STC on the scene, there was no need to allow the extra cushioning for freight. The STC handled all the freight and fixed its price.

Seven ACC factories were taken for a cost examination as against six for the previous report. The procedure for calculating the ex-works cost was the same as before. The figure of cost did not include freight allowance. It only included : cost of materials, power and fuel, stores, labour and establishment, depreciation and overheads and packing charges. (This covered the cost of gunny and incidentals incurred in transporting them but not labour employed in branding and stitching etc.)

The basis for return was taken as Capital Employed (i.e. net assets comprising ^{net} fixed and current assets used in the business less current liabilities and provisions). The recommended rate of return being 10 per cent to high cost units, viz., Andhra Cement, Ashoka, Bagalkot and India Cements, 12 per cent to all low cost units, viz. ACC, Dalmia Bharat, Digvijay, Jaipur Udyog, Kalyanpur, Orissa

Cements, Rohtas, Sone Valley and Dalmia Dadri. For the two State Government owned factories, the return was fixed at 6 per cent.

The depreciation allowance was to cover the wear and tear on the fixed assets. When Gross Block is taken as the basis, it includes profit on that portion of the value of fixed assets which is already covered by depreciation. This when there are units of all ages in an industry (as there are in cement), the application of return on Gross Block is unsuitable because the Gross Block of old units continues to grow side by side out of the depreciation allowances already granted whereas new units start on a different footing.

The rehabilitation allowance was thought to be necessary in cement factories only after the tenth year of commissioning the plant and equipment. Only those with equipment installed prior to 1949 were, therefore eligible for this allowance.

As far as packing was concerned, the Indian Jute Manufacturers Association stated that they were capable of providing the gunny sacking required by the cement industry, so second hand bags were dispensed with. Uptil then the Government had recommended the use of second hand gunny bags to the extent of 20 per cent of the total use of gunny sacking.

The average weighted price recommended came to Rs.58.10 per ton in 1958 as against Rs.54.60 in February 1954. The Government accepted these prices for a period of 3 years commencing from 1st July, 1958.

In January 1960, however, the ex-works prices were increased by the Government consequent on the implementation of the recommendations of the Central Wage Board for the cement industry.

Third Tariff Commission, 1961

In 1961, 34 cement factories were in production, out of which 14 units were owned by ACC. Of the remaining, 2 were public sector units and the rest were in the private sector.

A detailed cost investigation of 19 units was done by Cost Accountants and the weighted average ex-works price for naked cement was Rs.74.49 per tonne.

Capital employed was taken again, as the basis on which return was to be calculated. This return was supposed to be sufficient to provide for bonus, gratuity, interest on borrowed capital and debentures, dividends to preference shareholders, income-tax, wealth tax, and, finally to leave a residual which would enable the producer to declare an appropriate dividend to the equity shareholders. The

recommended rates of return were between 8 per cent and 14 per cent.

There was no case for a rehabilitation fund since any plant which had gone into production ^{or before ?} after 1955-56 would have already recovered their replacement funds from the depreciation provisions. Only 6 units were granted this allowance.

Although the Commission had recommended 10 differential prices ranging between Rs.67.50 per tonne and Rs.79.50 per tonne, the Government decided in favour of a uniform retention price of Rs.69.50 per tonne. An additional Rs.3.00, Rs.5.50 and Rs.25.50 were allowed to a few units incurring appreciably higher costs. This is because, the Government felt, a uniform price would have the effect of compelling the higher cost units to seek economies in their production. India Cements, Digvijay Cements, Birla Jute, Kalyanpur, Sone Valley were allowed Rs.3.00 and Panyam, Saurashtra and Madras, Rs.5.50 per tonne. Prices for the new units were to be fixed on an adhoc basis. Price for Travancore Cements, however was inflated by Rs.25.50. The 3 tier ex-works price for low, medium and high cost units were Rs.69.50, Rs.72.50 and Rs.75.00 respectively.

The resultant price of naked cement was Rs.94.00

per tonne plus excise duty.

Subsequent to the Commission's report in 1961, upto the beginning of 1966, increases in ex-works prices of cement were allowed 4 times by the Government. In 1963, an increase of Rs.2.75 per tonne was sanctioned. In 1964, there was another increase. These were to counteract the increases in the prices of raw materials as well as the effects of certain Government policies which had led to increases in rail freight, sales tax, etc. which could not be sustained by the contingency allowance of Rs.2.00 per tonne already contained in the price structure. In 1966, there was another increase (over the one in 1965, of Rs.4.00 per tonne) of Rs.13.00 per tonne. During this time the 3-tier ex-works prices high, medium and low cost units were Rs.90.50, Rs.93.50 and Rs.96.00 per tonne. During the same year, came the decontrol of the industry and the formation of the Cement Allocation and Coordinating Organisation (CACO).

The industry was delicensed from 13th May, 1966 to 19th February, 1970. During this period, a capacity of 30.4 lakh tonnes ^{went} were into production. Out of this capacity, a capacity of 25.9 lakh tonnes was licensed prior to the delicensing of the industry⁴ i.e. before 13th May, 1966.

⁴ Report of the Estimates Committee of the 5th Lok Sabha, 1973-74, pp. 34-36.

In the light of the recommendations of the Administrative Reforms Commission, the Industrial Licensing Policy Inquiry Committee and of the Planning Commission, the Government decided to make changes in:

- (a) the Industrial Licensing Policy,
- (b) the policy in regard to assistance from public financial institutions, and
- (c) the policies relating to the growth of the public sector.

With the exemption limit of licensing being raised from Rs.25 lakhs to Rs.1 crore in 1970, the Government decided that the then existing exemption of a number of industries from licensing requirements be withdrawn. Licensing for the cement industry, thus was reintroduced in February 1970. Under the licensing policy announced in 1970, the Ministry of Industrial Development opened the cement industry to larger houses. However, the Cabinet Committee on Economic Coordination, 1973 decided that larger houses need not be allowed to put up additional capacity since the aim was to attract new entrepreneurs. A total of 74.15 lakh tonnes capacity applied for by larger houses was thus rejected.

In February 1973, however, the industrial policy included cement as one of 19 industries open to larger industrial houses. Each rejection was reviewed and many were sanctioned.

To go back to 1968, with effect from 1st January, the Government resumed its control over the industry because serious defects were noticed in the system. The Cement Control Order was promulgated with effect from 1.1.1968. Under the provisions of this order, the uniform f.o.r. destination price and multiple ex-works prices were notified. The STC was not involved in the distribution and marketing of cement either. The Government believed that the Control Order should be so devised as to entrust the sale of cement to the directions of the Government. The difference between the f.o.r. destination price and the producer's dues were decided to be remitted to a Cement Regulation Account to enable the Government to meet the expenditure on freight, export subsidy and administrative expenses.

This system worked well as a regulatory mechanism but the Estimates Committee in 1974 noted that there were some disproportions in the distribution of cement. These were apparently, because there had been contraventions of this order. "Authorisations for cement were issued by the Cement Controller in excess of the available supplies with the result that cement producers exercised their discretion to choose the consumer for supply of cement which caused avoidable hardships and inconvenience to the authorisation holders."⁵ The freight pooling system had been sought to be

⁵ Estimates Committee Report of the 5th Lok Sabha, 60th Report, 1973-74, p. 68.

removed in 1970, but it was noted that there were a number of advantages of the system and the control was therefore not lifted.

Also, the cement movement from surplus to deficit areas was facilitated by the freight pooling. In the absence of such a system, the producers would be interested in merely selling their product near the factories, further aggravating the problem of deficit areas. The producers in deficit areas would therefore be able to make larger profits than those in the surplus areas, thereby putting the consumer in a difficult position.

Arguments against the freight policy were mainly in view of the objection to consumers in surplus areas having to subsidise those in deficit areas. Also, factories were being located regardless of their proximity to consuming outlets. The cement industry is not a footloose one and requires to be closed to its limestone source.

When controls were re-imposed on the industry with effect from 1st January, 1968, the industry reported an upward revision of the price as a result of increases in cost.

On 16th April, 1969, a uniform ceiling ex-works price of Rs.100.00 per tonne was announced by the Government.

This was inclusive of an amount of Rs.7.00 per tonne, because of increases in the cost of production since 1st January, 1966. The f.o.r. destination price was Rs.129.13 per tonne.

This price remained unchanged upto 15th September, 1973, when the Government allowed an interim increase of Rs.10.00 per tonne.

Tariff Commission, 1974

On the eve of the 1974 Tariff Commission Inquiry, the cement industry was in poor shape. The capacity utilisation had gone down from 86 per cent in 1969-70 to 74 per cent in 1973-74. Production was almost static at 14.66 million tonnes in 1973-74 and 14.80 million tonnes in 1974-75. As of 1973, there were 52 units, 20 of which belonged to ACC. The Porbandar unit of ACC was the oldest one. Capacity was unevenly distributed throughout the country with 37.6 per cent of the total in the South, 28.4 per cent in the West, 17.4 per cent in the North and 16.6 per cent in the East.

The Commission took a sample of 23 factories, which were costed by the Cost Accounts Officers. In choosing these factories, attention was paid to various factors which influence costs like the "location of the factory, capacity, regional distribution, process of manufacture adopted and age of plant, etc."⁶

⁶ Report of the Tariff Commission, Government of India, 1974, p. 11.

The estimates of ex-works cost of naked cement included an increase in the contingency allowance and depreciation. Also an increase in the return on capital employed was suggested. The Commission was not in favour of separate retention prices and decided on the fixation of one uniform price. An additional price was recommended for expansion and new units. The costed units showed a capacity utilisation of between 45.9 per cent and 110.8 per cent. This variation was due to the advantages of rail wagons, coal, power supply etc. The average worked out to 80 per cent and the Commission based its recommendations on this result. Depreciation was worked out on the written down value basis taking into account the 3 shifts. The prices recommended were to be in effect for about 5 years, thus coinciding with the period of the Fifth Five Year Plan.

The rehabilitation allowance was recommended again, as, about 1.6 million tonnes capacity was accounted for by kilns which were more than 30 years old. New units were recommended to get Rs.10.00 more on the retention price. This, to compensate for the continually increasing capital cost involved in the setting up of a new unit.

Also recommended was the creation of a Cement Development Fund which could provide long term interest free loans for setting up additional capacity in the industry.

As far as escalations in price were concerned, the Commission recommended that "for every increase of Rs.0.60 per tonne in the present railway freight of Rs.7.60 per tonne for 40 kms, the retention price may be increased by Rs.0.50 per tonne."⁷

The Government did not accept the automatic escalations or the creation of the Development Fund. It did however allow for limited escalations in the price on account of increases in the price of coal, freight on coal, power tariffs and wages.

The price of Rs.131.00 implemented by the Government included Rs.0.50 towards R & D and Rs.10.00 rebate to be allowed on purchases by Government departments.

The price, however, did not remain static upto the next examination of the industry in 1978 and there were no less than 6 upward revisions.

In 1978, a high level committee, the "Lavraj Kumar Committee" was set up and a 3 tier price formula was announced on 3rd May, 1979. This was based on the recommendations of the Bureau of Industrial Costs and Prices (BICP) and the Lavraj Kumar Committee. Also, a 12 per cent post-tax return on net worth (this includes Share capital,

7 Report of the Tariff Commission, 1974, p. 167.

Table 2.2 : Uniform Pricing System

Period	Retention price (Rs.per tonne)
16. 4.69 to 14. 9.73	100.00
15. 9.73 to 1. 8.74	110.00
2. 8.74 to 14. 9.74	134.20
15. 9.74 to 30. 9.75	139.15
1.10.75 to 30. 6.76	157.75
1. 7.76 to 31.10.76	161.40
1.11.76 to 30. 9.77	159.55
1.10.77 to 2. 7.78	161.12
3. 7.78 to 6.12.78	165.82
7.12.78 to 2. 5.79	168.91

Source : ACC: "Data on Cement Industry".

reserves and surpluses) was implemented. Retention prices for high, medium and low cost units were fixed at Rs.220.00, Rs.205.00 and Rs.185.00 per tonne. A price of Rs.296.00 per tonne for new factories was recommended to ensure the post-tax return on net worth. All prices were linked to 85 per cent capacity utilisation, and the Committee estimated that, for every fall of 5 per cent in capacity utilisation below 85 per cent, there was a reduction in return of Rs.5.00 per tonne to the industry.

The Committee on Controls and Subsidies in its report (May 19, 1979) had, in respect of the cement industry, observed that price control had been a strong inhibiting factor. It however, recommended that while price and distribution controls could not be given up, differential retention prices should be worked out so as to encourage creation of capacity in deficit areas (i.e. North, East and North Eastern regions of India).

Meanwhile, the losses in the industry were becoming significantly aggravated by the lack of escalations to neutralise cost increases. The Lavraj Kumar Committee had recommended escalations every quarter or 6 monthly, but the Government limited these to annual increases. Consequently, the loss to the cement industry was estimated by ACC to be as high as Rs.27 crores between 1978 and 1979. The industry claimed a price increase of Rs.28.54 from 3rd May, 1980 (Rs.11.14 representing cost escalations between July 1978 and May 1979 plus Rs.17.40 for the 12 month period ending 3rd May 1980). Instead, the Government granted only an increase of Rs.13.65 per tonne.⁸ The table below shows movements of the 3 tier pricing system that was followed upto 1981. There was a separate price for new units in order that they may be able to recover some part of their investment. The existing units were categorised as high, medium or low cost units and separate prices were fixed for these.

⁸ State Bank of India, Monthly Review, February 1982, pp. 64-73.

Table 2.3 : 3-tier Pricing System

Period	Retention price (Rs.per tonne)
From 3.5.1979:	
(a) For existing units	185/205/220
(b) For expansion/new units	296
From 3.5.1980:	
(a) For existing units	198.65/218.65/233.65
(b) For expansion/new units	309.65
From 3.5.1981:	
(a) For existing units	233.39/253.39/268.39
(b) For expansion/new units	344.39

Source: ACC : "Data on Cement Industry".

In 1981, the Cement Development and Price Review Committee headed by Dr. A.K. Ghosh was established. A dual pricing policy was recommended whereby two-thirds of the production capacity was to be sold as levy cement to the Government at a uniform price (in the case of sick units, only half the capacity was to be levied). For units commissioned after 1st January, 1982, the levy requirement was 37.5 per cent in the first year; 42.5 per cent in the second year and 50 per cent in the subsequent years of production.

With effect from 28th February, 1982, Ordinary Portland Cement (OPC) and Portland Slag Cement (PSC) were priced at Rs.335.00 per tonne and Pozzolond Portland Cement (PPC) at Rs.320.00 per tonne.

The open market prices were monitored by the Cement Manufacturing Association (CMA) which had five to six regional commissions. The whole country was divided into six zones. An Apex Monitoring Committee under the President is assisted by these regional commissions. The Cement Controller is a member of the Apex Committee. While the Apex monitored supplies to all areas, including distant and deficit pockets, the Regional Committees fixed prices to be charged from consumers in different regions. This system of control was radically different from that of the STC in the late 1950's and early 1960's.

So much for the controlled price. The open market price in 1982 varied between Rs.1300.00 to Rs.1360.00 per tonne. The levy cement was used by State and Central Governments; for factory construction in large and medium industries in backward areas, export oriented industries and industries in the Central, State and Cooperative Sector and to small consumers constructing dwelling units having a plinth area upto 80 square metres. Small scale industrial units would also get levy cement for construction

and raw material purposes. Also there was reservation of cement for the priority sector of irrigation and power.

Levy cement would not be made available to large and medium houses as raw material, or for the construction of hotels, cinemas, restaurants, multi-storeyed or commercial building as well as residential houses having a plinth area of more than 80 square metres.

As a result of this partial decontrol, during 1982-83, there have been a number of price rises. In March 1983, cement manufacturers hiked the price of open market cement by Rs.80.00 per tonne following the imposition of an additional excise levy in the latest budget. This new policy of the Government has created a favourable climate for investment and expansion and also a spurt in its wholesale price. With 1970-71=100, the index of wholesale prices of cement in March 1983 was 400.⁹ According to Palkhivala, "the cement industry has joyously come out of the intensive care unit."¹⁰

In all this, there emerges the question of whether or not these measures of control over prices and distribution have been effective. The method of estimating the prices by each committee has been the "cost plus" pricing concept.

9 Economic Times, 7th May 1983, p.6.

10 ACC, Annual Report, 1981-82, "Statement of the Chairman".

However, with this method, the market conditions of demand and supply are not incorporated in the price and the justification of whether or not the price is a fair one tends to be subjective. Though this is not the ideal way to arrive at a suitable price, it is perhaps the only way in the context of administered pricing. The table below gives us some idea of the movement in prices as compared to the demand supply gap.

Table 2.4 : Ex-works prices and the Demand-Supply gap

Year	Production (Mn.tonnes)	Demand (Mn. tonnes)	Gap (Mn. tonnes)	Ex-works price (Rs. per tonne)
1963	9.355	12.8 *	3.445	69.50
1968	11.943	12.0**	0.057	90.50
1973	14.999	18.8**	3.801	110.00
1978	19.41	24.00*	4.59	168.91

* Tariff Commission Report, 1961, p.67.

** Estimates Committee of the 5th Lok Sabha,
(1973-74), p.71.

* Ministry of Industry (actual).

Sources : (1) ACC "Data on Cement Industry".
(2) BICP Report, 1978.

The prices have not moved according to the market conditions for cement. Instead they have been tied to the costs of raw materials and other production expenses.

Under normal conditions in an economy, price is determined by the interaction of the prices of demand and supply. When demand increases, the price automatically rises, and if this higher demand is maintained for a long period, the production of the commodity is adjusted to this demand at a lower price in the future. Price therefore plays an allocative role. A ceiling price is imposed when dangers of "profiteering" create imbalances in the economy as well as in some cases where the commodity is required to be available at a reasonable rate for essential activities (like those of development). A ceiling price fixes the price at some level below the "equilibrium price". The Government therefore has to artificially bring the demand down by means of rationing and quotas. Though there is some degree of dissatisfaction among those whose demands are not met, at least the commodity is within the reach of most consumers.

After the STC relinquished hold of the distribution of cement, the Government began allocating certain proportions of cement for the open market. Upto 1982, the quantity of cement supplied to Government departments, including public undertakings and organised sector of industries, etc. was about 40-42 per cent of the total cement production in the country.¹¹ "The remaining 60 per cent was available for sale to the public. Between 1973 and 1978,

11 60th Report of Estimates Committee, 1973-74, p. 140.

the demand of the Central and the State Government has gone up and about 60 per cent was earmarked for them. In addition, 10 per cent was meant for the organised sector like industries, etc. and that left merely 30 per cent for free sale to the public. The 1974 Tariff Commission enumerated the malpractices of the distribution system, viz. (i) adulteration of cement, (ii) leakages from Government quota, (iii) collecting full payment in advance of deliveries and delaying supplies. In the modified system of 1978, the states were to bear full responsibility for distribution in their areas so that each state could check black marketing more easily. The Central Government projects like power and irrigation were given their full requirements and the remainder was left to other uses. Out of the latter, the States again claimed a major portion. For the free sale cement, a system of permits was introduced. Also, one of the reasons for the prevailing black marketing was said to be the reduced quantity of free sale cement. The Estimates Committee recommended in fact, that the Government "curtail its consumption of cement to the extent possible and exercise utmost economy in the use of cement in Government constructions."¹²

The 1982 partial decontrol policy required two-thirds of the production as levy cement i.e. at Rs.37.00 per bag.

¹² Estimates Committee, op.cit., p.81.

Table 2.5 : Cost structure (as % of value of production) of cement companies

	1971- 72	1972- 73	1973- 74	1974- 75	1975- 76	1976- 77	1977- 78	1978- 79	1979- 80	1980- 81
Manufacturing expenses	57.0	59.0	62.2	62.7	64.9	67.1	65.4	63.7	69.5	74.1
Remuneration	11.8	12.7	14.0	15.0	14.1	13.8	13.3	13.1	13.4	13.3
Depreciation	5.9	5.6	5.1	4.9	3.8	3.6	3.7	4.0	3.3	3.9
Interest	3.7	3.8	3.9	3.9	3.2	3.5	3.3	2.3	2.9	3.6
Others	15.3	16.1	16.5	14.8	10.4	11.7	11.5	13.2	9.4	7.8
Total operating cost	93.7	97.2	101.7	101.3	96.4	99.7	97.2	96.3	98.5	102.7
Profit/loss Margin	6.3	2.8	-1.7	-1.3	3.6	0.3	2.8	3.7	1.5	-2.7

Source : Economic Times, dated 7.5.1983.

Under the existing system, the states are left to work out the distribution machinery. It is difficult to say whether or not this proportion is an ideal one as there have not been any studies on the requirement of cements sector-wise, although this was recommended to have been done by the Estimates Committee.

The distribution system has tried to ensure development of priority sectors and the extent to which it has been successful is not easy to evaluate. Suffice it to say that the method of trial and error seems to have come to an appropriate conclusion, judging by the enthusiasm with which the policy was received.

The all important question of whether or not the producers and consumers have been protected remains to be examined.

The first three Commissions based the ex-works cost on the actual incidence of the cost and not on any particular norms. This enabled even inefficient units to continue production without any inhibitions. The weighted average cost turned out to give the low cost firms necessary surpluses and the high cost ones suffered losses.

Where the cost-price leakage is concerned, there have been some discrepancies (it is important to note

here that the 1953, 1958 Commissions expressed their costs in terms of tons upto 1960, when the system went metric). The ex-works cost had increased at a rate of 2.11 per cent per annum between 1953 and 1960-61 and the actual ex-works price implemented by the Government increased only by 1.55 per cent per annum during the same period. Between 1960-61 and 1971-72,¹³ the ex-works cost increased by 8.42 per cent per annum; the ex-works price, however, recorded a rate of growth of only 7.26 per cent per annum. The cost structure as a percentage of value of production is shown in Table 2.5 for the years after 1971-72 upto 1980-81. It is evident from these figures that the costs have outstripped the prices as a result of which the profitability of the industry suffered. As can be seen from the table, the industry just managed to break even and incurred losses in some years i.e. during 1973-74, 1974-75 and 1980-81.

This is definitely unfavourable to the industry and it means that the cement manufacturer is forced to absorb the rise in costs resulting in reduced profit margins. The works cost does not take into account the fact that the return on capital should grow at a rate slower than the ex-works price, because the latter,

¹³ V.K. Goel, N.K.Nair, "Productivity Trends in the Cement Industry in India", NPC, 1978, p. 93.

taking into account the return on capital, needs to allow for the increasing capital intensity in the industry.

The capital intensity increased at a compound rate of 5.3 per cent per annum, between 1959 and 1971.¹⁴ This is as measured by the capital-labour ratio. Even if both ex-works cost and return on capital had increased at the same rate, the return on capital would have declined.

The increasing capital intensity coupled with the net difference between increase in works cost and increase in works price has contributed substantially to reducing the profitability in the industry.

terms etc The other problem is the fact that automatic escalations in the price, consequent on increases in input costs were not permitted by the Government and often, it happened that the approved escalation took so long that in the meantime rising costs had already caught up with the permitted increase in prices. In 1975, when an escalation of Rs.78.60 was granted 3 months late (instead of on 1.7.1975) the industry had according to one estimate suffered a loss of Rs.7 crores. Thus there have been some administrative lags in the implementation of the controls.

A resume of the costs of production under the

¹⁴ V.K. Goel and N.K. Nair, op.cit., p. 31.

various Tariff Commissions is given in Table 2.6.

From 1951-52 to 1977-78, the increase has been almost fourfold. The increase in the retention prices has not been to this extent, however.

The consumption per tonne of clinker of the raw materials is as given in Table 2.7.

The average annual rise in wholesale prices of cement during the period 1960 to 1975 was 9.33 per cent. The item "fuel, power and lubricants" rose by 15.10 per cent per annum during the same period. The annual rate of increase was 14.09 per cent for industrial raw materials, 10.20 per cent for manufactures, 14.81 per cent for intermediate products and 10.18 per cent for finished product also between 1960 and 1975. The all commodities price index rose by 13.61 per cent per annum between 1960 and 1975.¹⁵

The price of coal, the major fuel item in the cement industry increased by about 7.63 per cent per annum between 1960 and 1975.

It may be of interest to note at this stage, that, although the prices have increased over the years, a large proportion of the price has either gone to the Government as excise duty, or towards selling and packing expenses.

15 V.K. Goel, N.K.Nair, op.cit., p.114.

Table 2.6 : Composition of works cost estimated in successive Tariff Commissions and High Level Committees

	(Rs./tonne)				
	1951-52	1956-57	1960-61	1971-72	1977-78
	Actuals	Actuals	Actuals	Actuals	Actuals
No. of factories covered	(18)	(22)	(31)	(23)	(19)
1. Raw materials	8.98 (22.7)	9.79 (22.5)	10.78 (21.9)	5.35 (5.5)	19.84 (13.6)
2. Royalty and transport	*	*	*	7.78 (8.0)	7.15 (4.9)
3. Labour and establishment	12.55 (31.8)	5.34 (12.3)	5.66 (11.2)	13.15 (13.5)	15.33 (10.5)
4. Stores and repairs	×	3.99 (9.2)	4.63 (9.2)	10.85 (11.2)	19.29 (13.2)
5. Power and fuel	13.43 (34.0)	14.80 (34.0)	18.25 (36.1)	33.38 (34.3)	51.61 (34.4)
6. Depreciation	4.54 (11.50)	6.05 (13.9)	8.16 (16.2)	12.16 (12.5)	10.22 (7.0)
7. Overheads	×	2.78 (6.4)	2.10 (4.2)	9.67 (9.0)	22.41 (15.4)
8. Packing (other than gunnies)	-	0.73 (1.7)	0.91 (1.8)	9.22 (4.3)	**

contd.

Table 2.6 : (contd.)

	1951-52 Actuals	1956-57 Actuals	1960-61 Actuals	1971-72 Actuals	1977-78 Actuals
9. Contingencies	-	-	-	-	-
10. Minimum Bonus	-	-	-	0.68 (1.7)	-
11. Research	-	-	-	-	-
Total cost of naked cement	39.50	43.48	50.49	97.24	145.85
Index of cost with 1951-52 = 100	100.00	110.07	128.61	246.18	369.24

Bracketed figures are percentages

- * Included in raw materials
- * Included in item 3
- ** Included in various elements of expenses.

Table 2.7 : Consumption per tonne of clinker (1978)

Raw material	Consumption
1. Limestone (tonnes)	1.37-2.03
2. Gypsum (tonnes)	0.03-0.06
3. Coal	0.0256-0.392 (Wet process) 0.177-0.288 (Dry, Semi-dry)
4. Power (kwh)	93-145 (Wet process) 106-150 (Dry, Semi-dry)

Source : BICP Report, 1979.

Table 2.8 : Excise duty component

As on	Excise duty (Rs. per tonne)
1.1.1955	5.00
1.1.1960	20.00
1.1.1965	23.60
1.1.1970	30.68
1.1.1975	66.83
1.1.1980	68.25

Source : V.K. Goel, N.K. Nair, "Productivity Trends in Cement Industry in India, NPC, 1978, p. 108.

The excise duty has increased rapidly since 1955, when it was first imposed. The tax has formed a large part of the price increases, in fact, as have the selling expenses and packaging, leading to a further drop in the remuneration to the manufacturers.

The prices of cement have not, as is obvious from the above, kept up with the escalations in the costs of production. Table 2.5 shows the trends of the costs of production. The depreciation component fell, in 1977-78 to 7.0 per cent of the cost, from 12.5 per cent in 1971-72, Overheads also increased in 1977-78. Other items remained almost the same in respect of the total cost, although absolute cost increased steadily,

The overall development of the industry has been a major objective of the various Tariff Commissions. In the following pages, we shall endeavour to portray the industry as it developed vis-a-vis the Tariff Commission recommendations.

The age-wise distribution of the units has remained almost the same over the 20 year period and the industry seems to have just maintained its plants rather than modernising them. In this context, it may be interesting to note the changing technology. Whereas in 1953, only 2 units were on the dry process, by 1964, there were 10 such

Table 2.9 : Age pattern of units (as at the time of various Tariff Commissions)

Age (years)	1953	1958	1961	1974
Less than 5	6	5	6	6
5 - 9	2	6	5	8
10 - 14	5	2	7	4
15 - 19	3	5	1	8
20 - 24	-	3	6	3
25 - 29	1	-	2	6
30 - 34	4	1	-	8
35 - 39	1	4	5	-
40 - 44	1	1	1	1
45 - 49	-	1	1	-
50 +	-	-	-	6
Total plants	23	28	34	52

Source : Compiled from Tariff Commission Reports.

units. There has been a tendency to modify the ob^osolete wet process plants and replace them with the dry ones which are more fuel efficient.

The plant size has been increasing rapidly as a result of the finding that larger plants are more economic.¹⁶

Table 2.10 : Size of plants

Capacity Range '000 tonnes per year	Number of units in				
	1953	1958	1961	1974	
Less than 100	7	5	6	4	
100 - 200	5	3	4	4	
200 - 300	7	12	11	12	
300 - 400	4	5	10	11	
400 - 500	-	3	}	10	
500 - 600	-	-		4	
600 - 700	-	-		1	
700 - 800	-	-		3	1
800 - 900	-	-			2
900 - 1000	-	-			1
1000 +	-	-			2
	23	28		34	52

Source : Compiled from various Tariff Commission Reports.

In 1974, all the new plants were of large capacity as can be seen from the table.

With regard to the effects of the policy of freight pooling. This was to enable the newcomers to the industry to locate their plants closer to the retail outlet, thus making the industry more footloose than it had been in the past.

Table 2.11 : Regionwise distribution of production and consumption of cement
(000 tonnes)

	North	East	West	South	Total
1968					
Production	2,214 (18.6)	2,249 (18.9)	3,249 (27.3)	4,180 (35.1)	11,892 (100.0)
Consumption	3,251 (28.1)	2,504 (21.7)	2,836 (24.5)	2,969 (25.7)	11,560 (100.0)
1976					
Production	2,707 (14.5)	3,036 (16.3)	5,798 (31.1)	7,073 (38.0)	18,614 (100.0)
Consumption	5,363 (30.2)	3,364 (19.0)	4,338 (24.5)	4,670 (26.3)	17,735 (100.0)

Bracketed figures are percentages

Source : (1) Tariff Commission, 1974, p.32.
(2) NCAER, "Cement Industry in India", p.26.

The above table shows that there has not been any lessening of the regional imbalance. The Northern and Eastern regions were still deficit in cement; particularly the Northern region. The South, a surplus region increased its surplus from 1,211 thousand tonnes in 1968, to 2,403 thousand tonnes in 1976 (Figures regionwise, were not available for later years).

The controls in the cement industry have been in existence now, since 1947. It is true, they have not been

uniformly rigid, throughout the period, but the industry has not been able to follow a free market policy for any length of time. The new dual pricing policy, it is hoped by the cement manufacturer, will give the industry some impetus. A lot remains to be done before the results of this policy will be evident, but in the meantime, the industry has improved its production performance, prices are reflecting (more than earlier) the existing market conditions and the Government is able to procure, (for its priority sectors of defence, development and irrigation) its requirement of cement.

CHAPTER III

CAPACITY UTILISATION, PRODUCTIVITY AND BARRIERS TO ENTRY

We have already witnessed the change that the cement industry has undergone under the six Five Year Plans that we have had. The ^{capacity utilisation} production capacity of the industry as well as the actual installed capacity are the very important indications of its state of health. In this chapter we shall investigate aspects of the industry's productivity and see why the existing oligopolistic position is unlikely to change.

The examination of capacity utilisation bristles with various technical difficulties and these may be noted. First of all, a correct assessment of installed capacity itself is a problem. Often, the determination of installed capacity is left to the Accountant or management and the veracity of this is not checked or assessed. In most Annual Reports, under the columns of installed capacity, the installed is "as certified by the Managing Director accepted by the Auditors."¹ It can, therefore, happen that an

1 ACC 4th Annual Report, 1979-80, p. 33.

undertaking applies for a licence and on obtaining it certifies to an over-estimate of its installed capacity. This is in order to avoid a likely threat or revocation of licences in the future. The resultant capacity utilisation will therefore be necessarily low and could lead to evidence of gross underestimation of capacity utilisation. A study conducted by the Indian Institute of Public Administration² revealed that of a total of 3,105 licences, 7.0 per cent had not had any installed capacity against the licences obtained. In 20 per cent cases, higher installed capacities than those licensed were found. The capacity utilisation showed zero per cent in 15 per cent cases. Also interesting, however, is that 8.0 per cent of the total showed over 100 per cent utilisation. Thus the word of the management cannot necessarily be taken as reliable in all cases, and caution needs to be exercised in coming to any conclusions regarding capacity and its utilisation.

A cent per cent capacity utilisation may, however, be reported in cases where there are inbuilt capacities for overextending production. In this case during periods of shortage or pressure on the industry, these capacities are utilised to their full extent, although they had been originally under-reported.

2 IIPA "Functioning of Industrial Licensing System", Economic and Political Weekly, April 30, 1983, p. 694.

In spite of all the drawbacks in its calculation, capacity utilisation is a very important indication of the performance of the industry. Continual under-utilisation of capacity is uneconomic. It results in higher costs and affects the competitiveness of the plant. It also leads to an increase in the capital-output ratios for the industry which in turn could lead to false conclusions about its capital efficiency and productivity.

By and large the factors which affect an industry's capacity utilisation are:

1. The location of the plants
2. The size of the plants
3. The age of the plants
4. The process of manufacture adopted
5. The ownership of the plants

In one way or another, these are reflected in the productivity, efficiency and investment in the industry.

Between 1965 and 1970 the conditions in the country for industrial prosperity were not very encouraging. Power shortages were common; coal was difficult to transport; railway wagons were in short supply and side by side, the prices of all these vital inputs were rising steadily (details in the previous chapter). It was only in 1974, after the Tariff Commission's recommendations

Table 3.1 : Trends in capacity utilisation

Year	Install- ed capacity in mill- ion tonnes	Produc- tion in mill- ion tonnes	Capacity utilisa- tion %	Trends in capa- city utilisation (Averages)	%
1960-61	9.30	7.97	86	1960-61 to 1965-66	88
1965-66	12.00	10.82	90	1965-66 to 1970-71	85
1970-71	17.59	14.35	82	1970-71 to 1975-76	78
1975-76	21.14	17.29	82	1975-76 to 1980-81	81
1980-81	26.44	18.55	70		

Source : ACC "Data on Cement Industry"

were implemented, that some improvement in the condition of the cement industry was evident. From 1974-75 to 1975-76, the capacity utilisation rose from 74 per cent to 82 per cent. However, this was shortlived, because prices of raw materials and shortages of railway wagons contributed to a fall in production. Production rose from 18.84 million tonnes in 1976-77 to 19.41 in 1977-78 and then remaining almost static in 1978-79, fell to 17.60 million tonnes in 1979-80.

Table 3.2 gives some indication of the reasons for shortfalls in production over a six-year period from 1970 to 1976.

Table 3.2 : Reasons for shortfall in production

	1970	1971	1972	1973	1974	1975	1976
Reported shortfall (in million tonnes)	2.96	3.91	3.47	4.28	4.12	3.43	2.19
Percentage share of factors in Reported loss :							
1. Repairs to kilns/breakdowns	8	11	6	2	-	-	
2. Repair to raw mill/shortage of clinker	2	1	2	1	-	1	4
3. Mechanical/Electrical troubles	9	4	2	5	8	13	29
4. Repairs to Cement Mill	5	6	3	1	2	4	
5. Short supply of Limestone/gypsum	1	3	1	4	1	5	5
6. Power breakdown/restriction	6	3	18	52	25	41	19
7. Short supply of wagons	31	38	34	12	11	7	1
8. Teething troubles of new units	7	8	9	2	1	3	1
9. Labour Strikes	7	5	19	10	4	16	26
10. Short supply of coal	-	2	1	7	45	4	-
11. Others	24	19	5	4	3	6	16

Source : BICP, "Report on Cement Industry", 1979, p.10.

Between 1970 and 1972, the main culprit for the shortfall in cement productions was the acute shortage of railway wagons. In 1973, power shortages took over as the villain of the piece. They together accounted for ~~52~~⁶⁴ per cent of the total loss in production. 1973-74 reported a capacity utilisation of 74 per cent, the lowest since 1950. 1973 was the year during which the shortfall in production was the highest, followed by 1974, 1974 was plagued by a short supply of coal to cement producing plants. Coal, is a very important raw material, not only as a fuel, but also as a component of cement. This shortage continued, however, and even in 1979, receipts were only 67.5 per cent of the total requirements. In 1980, it was even less - 53.04 per cent. The demand for coal by the cement industry is only 6 per cent of total national production of coal and less than 3 per cent of the freight carried by the Indian Railways. It is, therefore, a poor reflection on the infrastructural as well as the organisational facilities that requirements were not fulfilled to a greater extent. The problem was aggravated by the fact that, although the production of coal had gone up, that of lower grade coal outstripped the production of the high grade product. Moreover, the coal that meets up to the required standards of the cement industry has been reserved for the power houses and steel plants.

Table 3.2 reveals that strikes accounted for 26 per cent of the loss in production in 1976. But this should be viewed in the light of the fact that the actual capacity utilisation increased in 1976, so losses were less. The losses due to labour trouble were mainly on account of absenteeism in the industry and lack of coordination between the labour and the management.

Proper capacity utilisation, therefore, is closely connected with, and is a result of, the existing production conditions in the industry. Let us examine now the various factors that affect it.

Capacity Utilisation according to Regions

The location of the cement industry has been such that a certain lopsidedness in production has emerged. Plants in the western region, covering Gujarat, Madhya Pradesh and Maharashtra performed much better than those located elsewhere. The capacity utilisation here in 1980 was 82 per cent against a mere 59 per cent in the Northern region, which is also the least endowed with the requisite raw materials. The next best performance was registered by the Southern region consisting of Andhra Pradesh, Tamilnadu, Karnataka, Kerala, Pondicherry and Andaman, Nicobar and Laccadive Islands. Except during 1973 and 1974 when this region suffered heavily from acute power cuts

Table 3.3 : Capacity utilisation - Regionwise

Region	1971		1975		1980	
	Installed capacity (000 tonnes)	Capacity utilisation (%)	Installed capacity (000 tonnes)	Capacity utilisation (%)	Installed capacity (000 tonnes)	Capacity utilisation (%)
North	3,418	68	3,670	69	4,492	59
East	3,289	71	3,689	72	3,978	66
West	5,550	77	6,150	83	6,770	82
South	7,172	83	7,472	80	8,931	80
Total	19,429	76	20,981	77	24,171	77

Source : 1. NPC, "Productivity Trends in Cement Industry in India", 1978, p.13.
 2. ACC, "Data on Cement Industry" (1980 figures).

and nonavailability of coal, it has shown a significantly high level of utilisation of capacity.

In 1976, the Southern and Northern regions produced 69 per cent of the total output while their share in the productive capacity was only 63.9 per cent. In 1971, these 2 regions together accounted for 65.6 per cent of the total installed capacity in the industry. The Estimates Committee³ declared the Northern and Eastern regions deficit in cement. As of 1979 the approved licensed capacity was 21.25 million tonnes. Of this 25.5 per cent was in the North, 15.7 per cent in the East, 23.2 per cent in the West and 35.6 per cent in the South. There is thus estimated to be some evening out in the new capacity created.

By 1976, however, there was a shift in the location tendency and the share of the Northern and Eastern regions rose to 36 per cent as against 34.5 per cent in 1971. However between 1971 and 1976, the share of these regions in the production actually declined from 31.3 per cent to 30.8 per cent. 1976 was a bad year for factories in Sawai-Madhopur, Dalmia, Dadri and Bagalkot, whose capacity utilisation went as low as 35 per cent.

The low capacity utilisation in the North, was mainly on account of power cuts and shortages in coal supply. In order to improve the situation in the Northern and Eastern

³ 60th Report of the Estimates Committee of the 5th Lok Sabha, 1973-74, p. 103.

regions, the geological survey of India undertook a survey of cement grade limestone in these areas.⁴

Capacity Utilisation
according to Age

Apart from its proximity to limestone deposit, the cement unit as production has, to a large extent, to do with its machinery and equipment. It has been established⁵ that there is a correlation between the capacity utilisation and the age of the plant. A brand new plant for example, does not produce to its full capacity because of inefficiencies of production and teething troubles. As these constraints are gradually overcome, capacity utilisation improves until the plant becomes obsolete, when again there is a decline in its production. The best performance is by plants between the age of 6 to 15 years. After the age of thirty five, however, again the performance begins to improve, as most of the kilns have been replaced by then. Teething troubles had, in fact accounted for 8 per cent to 9 per cent of the total loss in production during the years 1971 and 1972 respectively. This is, because, during the years immediately preceding, there had been fairly large increases in capacity of the industry, e.g. in 1970-71, the capacity jumped to 17.59 million tonnes

4 Estimates Committee Report, op.cit., pp. 102-104.

5 V.K. Goel and N.K. Nair, "Productivity Trends in Cement Industry in India", p. 15.

from 15.96 million tonnes in 1969-70, a rise of over 10 per cent.

In Table 3.4, the capacity utilisation among plants between the ages 11-15 years was the highest - then comes the age group 6-10 years.

Table 3.4 : Capacity utilisation (%) according to age of factories

Age (years)	1971	1975	1980
0 - 5	64.19 (12)	65.11 (9)	43.67 (9)
6 - 10	80.49 (5)	90.13 (7)	73.80 (6)
11 - 15	76.23 (6)	91.36 (6)	85.80 (7)
16 - 20	77.55 (6)	72.61 (7)	81.00 (4)
21 - 25	79.35 (4)	62.29 (4)	66.30 (6)
26 - 35	91.45 (8)	72.84 (5)	75.46 (9)
Above 35	75.35 (8)	81.58 (15)	82.50 (13)
Total	76.00 (49)	77.00 (53)	72.6 (54)

The number of plants is given in brackets.

Source : (1) NPC "Productivity Trends in Cement Industry in India", p. 14
(2) ACC "Data on Cement Industry" for 1980 figures.

Capacity Utilisation according
to Size of the Plants

Of late, much effort has been spent on finding out optimum plant sizes for the cement industry. It has been pointed out that contrary to the popularly held opinion, modern cement plants of three thousand tonnes per day (tpd) capacity (i.e. one million tonnes per year) and above are best suited to India.⁶ The cost of production per tonne is much lower in the case of a large plant, e.g. in a 3,000 tpd plant, the cost per tonne is Rs.126.91. However in a plant of 50 tpd it is almost double at Rs.234.35.

Based on observations from the past, however, it has been found that the highest rate of capacity utilisation has been achieved by those units with capacities between 101 and 201 thousand tonnes per annum. In 1976, there were six such units and the utilisation was 93.9 per cent. These plants, to name them, were at Mandhar, Kurkunta (both Cement Corporation of India plants), Udaipur (Hindustan Sugar), Sewree (Digvijay Cements), Khalari (ACC) and Rajpalayam (Madras Cements).

The next in order of utilisation of capacity are 2 groups. The 100 thousand tonnes and below group and the 501-800 thousand tonnes group - both registering an average of 86.5 per cent approximately.

⁶ Hajra, S. "Economies of Scale in Cement Industry", ESRF, New Delhi, 1983, p.70.

Table 3.5 : Capacity utilisation (%) according to size

Size of plant ('000 tonnes per annum)	1971	1973	1976
100 and below	84.9 (4)	77.4 (4)	97.4 (4)
101 - 200	91.3 (6)	86.4 (6)	104.0 (6)
201 - 350	88.6 (12)	72.9 (13)	87.8 (13)
351-500	72.5 (15)	73.8 (15)	91.1 (15)
501 - 800	82.0 (7)	87.3 (7)	95.4 (7)
800 and above	69.8 (4)	61.1 (4)	76.0 (4)
Total	76.0 (49)	76.0 (50)	88.2 (53)

Source : V.K. Goel and N.K. Nair, "Productivity Trends in the Cement Industry in India", p. 16.

The study conducted by the ESRF pointed out that in 1975-76, for a 10 per cent difference in size, the cost of production could differ by 3.3 per cent. Also that the size and capacity utilisation together could explain 55 per cent of variations in the cost of production in 1975-76.

Capacity Utilisation and the
Process of Production

As of 1981-82, of the 152 kilns in 64 cement plants operated by 36 companies, 96 were based on the wet process and 56 on the dry/semi-dry process. Of the total annual installed capacity of 29.50 million tonnes, the wet process constitutes about 14.0 million tonnes i.e. 48 per cent of the total. Of these 96 using the wet process, 71 kilns were more than 20 years old and require 40-50 per cent more energy than the modern dry process plants.⁷ So far as capacity utilisation is concerned, little or no correlation has been discerned between the process employed and the utilisation of capacity.

Table 3.6 : Capacity utilisation according to process

Process	1971	1975	1980
Wet	76.5 (33)	74.1 (34)	73.9 (33)
Dry/Semi Dry	77.3 (10)	84.5 (13)	66.9 (17)
Mixed	74.6 (5)	81.2 (5)	89.9 (2)
Total	76.0 (49)	77.0 (53)	75.1 (52)

Source : (1) NPC "Productivity Trends in Cement Industry in India", 1978, p. 13.
(2) ACC "Data on Cement Industry" (1980 figures).

⁷ Economic Times, "Cement Industry", May 7, 1983.

The wet process does not have any inbuilt advantages over the dry process plants, except for the fact that the raw materials required differ in quality and quantity in the two cases. One reason for the low capacity utilisation of the dry plants during 1980, could be that most of them were new and experiencing teething troubles.

Table 3.7 shows the capacity as distributed between age and process of production in 1981-82.

Table 3.7 : Unit capacity in tonnes per day (tpd)

Age of Kiln	61-300	301-600	601-1200	1201-3000	Total
A. Wet Process					
1. Upto 10 years	1	2	-	-	3
2. 11 - 20 years	3	18	1	-	22
3. 21 - 30 years	11	18	8	-	37
4. 31 - 40 years	8	5	1	-	14
5. Above 40 years	16	4	-	-	20
Total	39	47	10	-	96
B. Dry/Semi-Dry					
1. Upto 10 years	5	4	15	4 ^a	28
2. 11 - 20 years	1	12	7	-	20
3. 21 - 30 years	1 ^b	3 ^b	1	-	5
4. 31 - 40 years	-	-	-	-	-
5. Above 40 years	2 ^b	1 ^b	-	-	3
Total	9 ^c	20 ^c	23 ^c	4	56
Grand Total	48	67	33	4	152

a - includes 23,000 tpd kilns under conversion.

b - includes one conversion from wet to dry

c - includes 1,5 and 3 units of semi-dry process in the respective capacity range.

Source : Dua, B.S. "Lessons from Japan", Economic Times, 7th May, 1983.

Out of those employing the wet process, 31 kilns were between 21 to 30 years old, the capacity utilisation of which was only 70 per cent (see Table 3.4). It should also be noted that under the dry category, 50 per cent of the kilns had a capacity of over 601 tonnes per day. Seventy four per cent of the wet kilns were over 20 years old and 90 per cent below 600 tpd capacity, 1200 tpd being the most economic. There were few dry kilns in the older age groups and they were only small ones with low capacities i.e. between 61 and 600 tpd. This is in sharp contrast to the wet kilns of which only 3 were below 10 years old: a mere 3 per cent. There were also no wet kilns larger than 1200 tpd capacity. This is perhaps because most of them were older and therefore not as large as is the modern tendency for cement plants to be.

Capacity Utilisation according to Management

Ownership patterns have not changed very radically in the cement industry. It is true that in 1965, the government set up the Cement Corporation of India, in the hope of achieving the Fourth Five Year Plan targets. Unfortunately, this was not possible, but what did happen was that this move gave the public sector a fillip. The private sector has, however, dominated the production of cement although the major consumer of cement has been the

government (both the centre and the states).

Within the private sector, there were various large houses which accounted for a major part of both the production and the installed capacity of the industry. Smaller producers have found it difficult to enter the industry because of the very high initial capital investment required (see section on "barriers to entry"). The oligopolistic conditions have, therefore, not changed very much and the private sector is by and large in the control of a few houses.

India is not peculiar in this respect as a number of countries have the same tendency. For example, in France, in 1976, four producers were responsible for 86 per cent of the total production of clinker; in U.K. 80 per cent.

The recent practice of the government holding equity in these large houses has become widespread. The financial institutions, the Life Insurance Corporation, General Insurance Corporation, the Unit Trust of India and the State and Central Government held 41.2 per cent of equity share capital in ACC in 1977. ACC accounted for 34.11 per cent of all cement production during that year (more details on ACC in a later chapter). The financial institutions also reserve the right to convert some part of the loans extended to these companies into equity shares. Thus, the

Table 3.8 : Ownership pattern (Percentage to total)

Name	1970		1977	
	Capacity	Production	Capacity	Production
ACC	39.08	37.45	32.19	34.11
Birla	8.32	10.48	13.86	15.40
Jain	11.19	11.40	9.66	7.78
Singhania	-	-	1.37	1.87
Dalmia	6.54	7.90	5.33	6.34
Somani (Bangur)	4.97	5.33	3.84	4.66
Total of Large Houses	70.10	72.56	66.24	70.16
Central Public Sector	1.18	0.37	2.74	2.36
State Public Sector	7.42	5.47	8.72	7.56
Total Public Sector	8.60	5.84	11.46	9.92
Others	21.30	21.60	22.30	19.92
Total	100.00	100.00	100.00	100.00

Source : BICP Report, 1979.

Government has secured a position of control in the industry. The public sector units have shown a lower utilisation of capacity than the private sector ones. One of the reasons for this is the location of these plants in remote areas, making transport to and from the plants very awkward.

Table 3.9 : Capacity utilisation according to management

Owners	1971	1975	1980
ACC	77.4 (17)	83.2 (17)	74.0 (17)
Other Private Sector Units	78.6 (25)	73.5 (28)	75.1 (27)
All Private Sector	78.1 (42)	77.8 (45)	74.7 (44)
Public Sector	62.9 (7)	75.3 (8)	65.9 (11)
Total	76.0 (49)	77.0 (53)	73.4 (55)

Figures in brackets are the number of units.

Source : (1) NPC "Productivity Trends in Cement Industry in India", 1978, p. 13.
(2) ACC "Data on Cement Industry" (1980 figures).

Also, the policy of the public sector units was to provide producing units in deficit areas, regardless of the difficulties. Thus, to make the industry more equitably distributed over the country, 1980 was a year during which the capacity utilisation as a whole for the industry was poor. This naturally reflected in that of all the sectors. In 1980, the number of plants in the public sector increased to eleven, another factor accounting for the low capacity utilisation. As we have seen new plants do have a lower capacity utilisation than the older ones.

Apart from the above causes of varying capacity utilisation, capital efficiency also accounts for some part of this parameter of production. The capital output ratio is a measure of the productivity in the industry, and also, to some extent, describes the deepening of capital trends in the industry. There are, however, a number of obstacles to results achieved through the use of this parameter.

First it is not possible to correctly aggregate capital investments. Each capital investment is done at a different price and in a different period. For example a machine costing Rs.10,000 in 1975 cannot be clubbed together with one bought in 1980 for the same price. The question of depreciation of a capital asset also arises and the value of capital is therefore very difficult to calculate.

Second, the output of the industry is not merely a function of the capital invested or, for that matter, of its capacity, but of power availability, railway wagons, etc. all of which have affected the production of cement deeply (as we have seen in an earlier chapter).

Taking into account these difficulties and admitting the limited application of such a study, let us look at capital output ratios of the cement industry.

Table 3.10 : Average C/O ratio at 1960-61 prices

Period	Cement	All Public Ltd. Cos.
1961-62 to 1965-66	5.7	3.9
1966-67 to 1968-69	5.9	5.6
1969-70 to 1973-74	7.0	5.2
1974-75 to 1977-78	7.9	5.3
1961-62 to 1977-78	6.6	4.9

Source : RBI Occasional Papers, Vol. 2 No.1, June 1981.

The ratio for the cement industry are higher than for the "all industries" average.⁷ The trend is an increasing one through the period which shows the increasing capital intensity (in as much as one can be vaguely guided by these ratios).in the industry.

The incremental capital output ratios (ICOR) also grew over the period. Increasing ratios over the period suggest that either there has been a changing technical composition of capital in the industry or that the investment is not always matched by expected additional output.

The capital intensity indices also provide an

⁷ Kripa Shanker, "A study of C.O. Ratios in the Indian Corporate Sector, 1961-62 to 1977-78". RBI Occasional Papers, Vol. 2, No.1, June 1981, pp.7-11.

explanation of capacity utilisation, capital intensity has a positive relationship with labour productivity (this could be attributed to productivity gains through higher mechanisation). And if we consider that employment is not available input and cannot vary with a change in capacity utilisation, then utilisation of capacity has a direct impact on labour productivity. Thus capacity utilisation not only improves C-O ratios but also contributes to higher labour productivity. Table 3.11 shows how the capital per labour rates has increased.

Table 3.11 : Capital intensity indices in cement
1961=100

Year	Capital/Labour
1961	100
1963	98.16
1965	105.66
1967	127.27
1969	147.76
1971	186.30

Source : V.K. Goel and N.K. Nair, "Productivity Trends in Cement Industry in India", NPC, 1978, p.33.

Having witnessed the developments in the concentration of the cement industry we noticed that nearly 70 per cent of the output of the industry in 1977 was accounted

for by large houses. This percentage was 60 in 1980, a reduction mainly due to the fact that the public sector had entered the industry. But let us look at the entry restricting policies of the existing companies.

Barriers to Entry

First, however, some reasons why many companies enlarge their scale of operations. This is because of the economies of scale they enjoy in doing so. Economies of scale exist if total cost increases less proportionately with any increases in output; diseconomies of scale exist if total cost increases more than proportionately with an increase in output. This leads to the reasoning that as output is expanded, there are economies of scale upto a certain level of production, after which diseconomies set in. This is because of the continued use of the fixed factors upto their optimal point and after. There are a number of factors that lead to increased profitability or economies of scale. To establish a large plant in the first place required a lower capital investment per tonne of installed capacity. In a recent study⁹ it has been brought out that high productivity plants in the cement industry are in general larger in size. According to this study fixed capital investment per tonne of capacity in 1974

⁹ "Manpower in the Cement Industry", Institute of Applied Manpower Research, New Delhi, 1976, p. 29.

was Rs.255 in a plant of less than 3 lakhs tonnes per annum, Rs.220 in plants of size 3 to 4 lakh tonnes per annum; while in plants of 4 lakh tonnes or higher, it was Rs.158.

Economies of scale also exist in the cost of production. As evident from Table 3.12, in 1975-76, 8 out of 14 large plants were below the Average cost, the smaller plants, however were mainly operating above the average cost conditions for the industry. There is also evidence that larger units in the cement industry employ proportionately less people. The large size firms employed 2 workers per thousand tonnes of output, whereas small firms employed 3.08.¹⁰

Economies of scale in the cement industry therefore have been found to exist. It has also been established that after a reasonable output (1 million tonnes), marginal cost of operations is less than Average cost and economies of scale come into play. Or, for a 10 per cent rise in output total cost rises by only 8.0 per cent to 8.5 per cent. It has also been established that larger plants do have a lower cost of production per tonne of cement, e.g. in 1976-77, it was estimated that plants with installed capacity of 16 lakh tonnes per annum and above had a cost of production of Rs.200.59 per tonne. Whereas plants between 8 and 16 lakh tonnes had a higher cost i.e. Rs.277.08. Plants below 8 lakhs were even higher i.e. Rs.302.14.¹¹

¹⁰ S. Hajra, op.cit.,p.82.

¹¹ B.S. Nagaraja Rao and Kamlesh Chander, "A Study of the Cement Industry in India", RBI Occasional Papers, Vol.1, No.2, December 1980, p.178.

Table 3.12 : Cost conditions of cement companies

Size Group (000 tonnes)	1971-72 Number of firms			1975-76 Number of firms		
	Above the Average cost	Below the Average Cost	Total	Above the Average cost	Below the Average cost	Total
100 and below	2	-	2	2	-	2
101 - 200	2	-	2	3	1	4
201 - 300	1	1	2	4	1	5
301 - 400	4	1	5	9	7	16
401 - 600	3	4	7	2	6	8
601 and above	1	3	4	4	2	6
Total	13	9	22	24	17	41

Source : S. Hajra, "Economies of Scale in Cement Industry", ESRF, p.56.

In another study¹² it has been estimated that though the cement industry's average cost of the industry was found to be:

$$Y = 65.6 + \frac{5622}{X} = 0.005X$$

in the form of $Y = ax + b + c/x$

To examine the types of barriers to entry are present in cement, a quick resume of the different types of barriers.

(A) The deterrent to entry will tend to increase as the minimum optimal scale becomes larger proportion of the total industry's output.¹³ If the proportion becomes 5 per cent or more of the total industry size, entry will have the result of either a lower price for all the producers, or a higher Average Cost (AC) for the entrant or all of them. The price would be lower either because the established firms do not want to have a new rival and they retaliate against his entry by reducing their prices, or because they do not want to reduce their outputs. The AC of the newcomer would be higher if he entered the industry at such a small and suboptimal scale that the market shares of the established firms are not disturbed and retaliation from their side is avoided. The AC would rise for all the firms (as well as the newcomers) even if the former are ready to cut their outputs to make a place for the latter, because the AC curve is falling. This is called

12 V.K. Gupta, "Concentration and Barriers to Entry in 29 Manufacturing Industries in India", *JL of Industrial Economics*, Vol. XVII, pp. 57-72.

13 J.S. Bain, "Barriers to New Competition", p. 55.

the "percentage effect" of scale economies.¹⁴ Post-entry profit of the newcomer would be smaller than his pre-entry expectations.

(B) "The deterrent to entry will tend to increase as...the rise of unit costs become steeper as scale is reduced below minimum optimal scale."¹⁵ This would be so only if the minimum optimal plant constitutes a significant proportion of the total industry size. Because if the newcomer enters at this significant scale, the demand curves of the established firms would be pushed to the left and outputs would be cut down. Accordingly, the steeper the AC curve before the minimum optimal scale, the higher would become their AC, the greater would be the cut in their profits due to entry, the more strongly they would retaliate against the entry and establishment of the newcomer and the weaker would be the inducement to enter. Even if the entrant secured a comparable share of the market without facing any retaliation, he has to start production at a scale less than the minimum optimal scale, with the result that the steeper the AC curve, the higher would be his AC and the weaker his inducement to enter. Neither of these effects would be present if the minimum optimal scale at which entry must be made constitutes only

14 V.K. Gupta, op.cit., p. 67.

15 J.S. Bain, op.cit., p. 55.

an insignificant proportion of the total industry size.

(C) "Absolute capital requirement effect" of the economies of scale. In some cases the capital required for starting a plant of minimum optimal size may be so large that relatively few individuals or groups could secure this capital. And even if they could it would only be at high interest rates and other terms which would place them at a new cost disadvantage. This is analogous to the threshold level for undertaking Research and Development (R & D) work involving a certain minimum level of investment. It is only those units which can invest large (i.e. threshold values, which in the case of cement would be high) sums on R & D who gain a benefit from these. It is thus a vicious circle because those who cannot afford this investment in R & D cannot grow and those who can are already large and therefore expand further. The oligopolistic position is, as a result, maintained indefinitely.

The author of the article, V.K. Gupta, has ascertained that the type of barrier that exists in the Cement Industry is of the "C" type. He also says that the height of the barrier would be expected to be negatively associated with the changes in the concentration ratios in the near future, rather than with the present concentration ratio which is only the result of the past ones. Merely illustrative of the high capital cost in this industry is the fact that the capital cost per tonne of installed capacity has increased from Rs.180.00 in 1961 to Rs.260.00 in 1965. In 1978, it was Rs.650.00. Thus, there does seem to be some evidence of the barriers of the type "C" in the Indian cement industry.

CHAPTER IV

A FINANCIAL OVERVIEW

It is true that the production of a commodity or the rendering of a service is the main function of business. This involves a multitude of functions like the planning of production, i.e. the quantity and quality, as well as taking important decisions in regard to size, location, technology of the producing unit. As we have seen in the preceding chapters the size, location and technology do affect the performance of the cement plants. The wet or dry processes affect the input-mix required. The wet process requires much less power per tonne of cement but more coal and this influences the raw material requirement of the manufacture, and which in turn affects cost of production. Again, depending on where the plant is located, the firm has to incur transport costs both for its raw material as well as its finished product. All these vital decisions ultimately get translated into finance.

In the following we shall examine the financial performance of the cement industry in recent years. Data pertain to years 1960-61 to 1978-79, a period of 18 years stretching from the Third Plan to the Fifth Plan. The

statistics are based on Reserve Bank of India's "Finances of Medium and Large Public Limited Companies" in the private sector. The figures relating to the period 1960-61 to 1970-71 take into account 16 cement companies. For the five year period, 1960-61 and 1965-66, RBI covered in all 1333 companies with a total paid-up capital of Rs.879.69 crores; for 1965-66 to 1970-71, 1501 companies with a paid-up capital of Rs.1421.75 crores, and for 1970-71 and 1975-76, 1650 companies were included having a paid-up capital of Rs.189,9.42 crores. In 1975-76 to 1978-79, 1720 companies were included with a paid-up capital of Rs.1386.79 crores. Of these, 16 were cement manufacturing companies between 1960-61 and 1970-71; 18 for the years 1970-71 to 1975-76; and 15 in the period between 1975-76 and 1978-79.

In respect of some ratios that have been calculated for the industry, for reason of non-availability of data, etc. not all the cement companies were included.

The cement industry has been through a period of varying fortunes as far as its financial strength and growth are concerned. Being an industry which has been under almost continuous Government control for most of the years we shall be considering, we will see that cement has been greatly related to the decisions of the policy makers. Profitability of the industry generally improved

after Tariff Commission reviews but since retention prices were fixed and very little flexibility was permitted to the manufacturers this was invariably not maintained. The objective was to provide remunerative prices to the producers, and at the same time, to ensure that consumers had the benefit of a reasonable price. As the two are completely contradictory to each other it was inevitable that either the consumer or the producer had to suffer. And as we shall see later on, it appears to have been the producer that has borne the brunt of these limitations. With 1970-71=100¹, price index of coal in 1975-76 had gone upto 184.2, i.e. gypsum to 151.3, limestone 187.2. The price of cement however rose to 170.5 in 1975-76. Furnace oil increased to 377.8 in 1975-76; fuel power, light and lubricants to 219.2.

The broadening of the capital base in the industry as well as the incentive to enlarge capacity (which, itself, is largely dependent on the overall health of the industry) fluctuated according to the availability of funds. For instance in 1976-77, the IDBI instituted a soft loan scheme for various industries in which cement industry was included, under which 3 loans were sanctioned for Rs.16.57 crores.² These were in order to pick the

1 Government of India, Revised Index Numbers of Wholesale Prices in India, April 1971 to December 1976, p.1.

2 Report on Currency and Finance, 1976-77, Economic Review, Vol. 1, p. 37.

industry up and encourage more investment.

We shall, first of all, examine the movements in the net fixed assets. These comprise the value of the land, buildings, plant, machinery, capital works-in-progress, furniture and office equipment less the depreciation provision. The growth of fixed assets reflects the growth of investment in the industry. In the case of cement the highest rate of growth (during the period under examination) was achieved in 1968-69, when it was 13.3 per cent over the previous year. For years 1971-72, 1972-73 and 1973-74, negative growth rates were recorded, showing the lack of new investment in the industry during those years. This was also reflected in the almost static installed capacity (19.4 million tonnes) in 1971-72 to 19.7 million tonnes in 1973-74. Capacity utilisation was at its lowest at 77 per cent in 1971-72. Looking at All Industry figures, it was only between 1966 and 1970 that the cement industry's net fixed assets grew at a faster rate than those in the other industries (i.e. during the years 1966-67, 1967-68 and 1969-70). Throughout the rest of the period, the growth rates have been smaller.

The Gross Fixed Assets comprise all the Fixed Assets. Since the figure includes the provision for depreciation, there were no negative growth years. This provision has actually been increasing, both as a result of the Tariff

Table 4.1 : Average growth rates (% per annum)

Years	Net Fixed Assets		Gross Fixed Assets		Net Capital Formation		Net Worth	
	Cement	All Industry	Cement	All Industry	Cement	All Industry	Cement	All Industry
1960-1975	4.8	7.7	8.0	9.7	7.0	8.7	4.3	6.7
1965-1970	9.3	5.7	10.1	8.3	9.6	7.5	8.7	5.9
1970-1975	0.6	6.5	4.4	8.7	3.4	9.7	3.3	7.9
1975-1979	3.0	8.0	5.2	9.2	3.1	7.2	5.0	6.0

Source : Compiled from RBI Bulletins.

Commission recommendations, as well as the increasing obsolescence in the industry. The total investments in the industry have increased fourfold over the 18 years. The Gross Fixed Assets were Rs.32,762 lakhs in 1978-79 as against Rs.8,636 lakhs in 1960-61.

The net fixed assets together with the inventories make up the net capital in the industry. This growth rate has shown a declining trend throughout the eighteen years for the same five year period between 1965 and 1970.

Table 4.2 : Net capital between 1965 and 1970
(in Rs.lakhs)

	1965- 66	1966- 67	1967- 68	1968- 69	1969- 70	1970- 71
Net Fixed Assets	7200	8085	9011	10656	11612	11953
Inventories	3410	3977	4775	4920	5147	5496
Net Capital	10610	12062	13786	15576	16759	17449

Source : RBI "Finances of Joint Stock Companies".

The figures in Table 4.2 are all at current prices.

During the 3 years 1971-72, 1972-73 and 1973-74, the growth of net capital declined and 1977-78 recorded an absolute low of 0.2 per cent after which there was a recovery to 9.6 per cent in 1978-79. The All Industries rate of net capital formation was consistently high whereas

in the cement industry, for a number of reasons the growth rate has fluctuated. 1970-75 were high input cost years and also difficult years where rail transport was concerned. Between 1968 and 1973, the percentage transported by rail fell from 72.8 per cent to 68.7 per cent and that transported by road increased from 26.7 per cent to 30.3 per cent.³ In 1974, about 70 per cent or more of the cement despatched was transported by rail, 20-30 per cent by road and less than 3 per cent by sea. There had been a continued shortage of railway wagons. This was because of the regional imbalance in the industry as a result of which there was a great demand for the movement of surplus cement from the Southern and Western regions to the deficit regions in the North and East. The decade 1960-61 to 1970-71 witnessed, according to the Railway Board, an increase of only about 70 per cent in the tonnage of cement lifted. During the same period on the other hand, the net tonne kms. of cement traffic registered an increase of 180 per cent. This additional movement threw a heavy strain on the availability of covered wagons. The Railway Board suggested that the industry encourage the split location of plants, so that open wagons may be used for the transport of cement. Grinding plants near consumption centres would reduce the requirement for covered wagons. Also, that the packing of cement be improved again, enabling

3 Report of the Tariff Commission, 1974, p. 117.

it to be transported in open wagons.

The question of split location of plants received further attention after the introduction of raw materials other than limestone. Fly ash and Blast Furnace slag are 2 such sources and it has been found viable to put up cement plants near steel plants and power units (where these are produced) and grinding units closer to the consumption points.

This would however necessitate duplication of facilities like clinker handling and storage system, high tension power receiving equipment and maintenance of workshops. Also more sophisticated dust suppression equipment would be needed in the grinding units nearer the urban areas.

However, the fact remains that there was a loss in production and therefore in profitability due to the shortage of railway wagons. In fact, in 1972, a production of 5 lakh tonnes was lost due to nonavailability of wagons from the Railways.⁴ Input costs were also very high as we have seen already, and there was hardly any increase in installed capacity during these lean years (1970-1975). Production actually declined from 15.55 million tonnes in 1973-74 to 14.80 million tonnes in 1974-75; the capacity

⁴ 60th Report of the Estimates Committee, 1973-74, p.84.

utilisation remaining constant at 74 per cent - the lowest in the cement industry until then. (It was to fall to 72 per cent in 1979-80). Since 1969-70, the growth of capital has remained below the All Industry level in the country. Apart from the actual structure of the industry, the availability of finances for long and short periods also plays a large role in determining its capital structure. Being a controlled industry, the proportion of publicly owned funds is relatively small and has been so over the entire period under consideration. Borrowings from financial institutions and banks have increased. In 1960-61, these amounted to Rs.2,171 lakhs and in 1976-77, Rs.10.036 lakhs. This figure fell, however, to Rs.8,575 lakhs in 1977-78, and rose slightly to Rs.9,690 lakhs in 1978-79, still remaining below the earlier amounts. The increase in the net worth during the years 1965-70, of 8.7 per cent per annum, financed the growth of the gross fixed assets which rose faster than the rate of increase of borrowings.

Net worth consists of paid-up capital and reserves (including general reserves). Unfortunately, because of the lack of adequate infrastructure facilities, there has been a general depletion of reserves in the industry. Among them were shortages in power (which resulted in a loss of 2-3 lakh tonnes a month during the year 1973).⁵

⁵ Estimates Committee, op.cit., p. 23.

coal and railway wagons. Being a continuous process industry, cement is adversely affected by any cuts in the availability of power. In the case of Mysore, Maharashtra, Andhra Pradesh, Kerala and Tamilnadu, a system was worked out whereby, if the State ensured a continuous supply of power, then the extra cement produced by this facility would be allotted as additional quota to the state concerned. Some states exempted the cement industry, but this was not total. In 1975, 41 per cent of the shortfall in production of cement was attributed to a restriction on the use and supply of power.

Where coal was concerned, the situation was also quite serious. The best quality coal fields are situated in the Bengal-Bihar area. Others are scattered over Orissa, Andhra Pradesh, Maharashtra and Madhya Pradesh. This entailed long and expensive transportation of coal from the coal fields to the various cement factories situated all over India (mainly close to limestone deposits).

Allocation of coal for the cement factories was made on the recommendations of the Cement Directorate. Upto 1968-69, the supplies were adequate. After this period, however the gap between the requirements and despatches continued to widen. In 1969-70, 89.9 per cent of the total requirements were received. In 1972-73 this was 63.7 per

cent⁶ and by 1980, the receipts of coal were only 53.04 per cent⁷ of the requirements. But this was not the only problem. The quality that is used also affects the efficiency of the cement plant. High ash coal tends to form ash rings in the kiln which retards the flow of clinker and leads to frequent stoppages of kiln operation. The admixture of coal ash with the clinker is also not homogenous and here, again, the high ash coal tends to affect the quality of clinker. Normally, Grade I coals are used by the cement industry, but these have been directed towards power houses at the expense cement.

The Government had taken some steps to ensure adequate supplies of coal to cement producers. It had set up a scheme of subsidy on movement of coal by road and by sea-cum-rail. However, these did not fully neutralise the cost to the industry. The use of furnace oil in the production of cement which had greatly helped some units also had to be discontinued because of the spiralling prices of furnace oil. (See above).

Accumulated losses, therefore, due to the above-mentioned factors also eroded the net worth. Thus, referring to 18 large sized cement companies, Dr. D.K. Ghosh said, "the accumulated losses of the companies increased from

6 Tariff Commission, 1974, p. 95.

7 ACC Annual Report, 1980-81, "Coal-Industry's Bugbear".

Rs.2.9 crores in 1971-72 to Rs.12.8 crores in 1974-75. In 1975-76, these losses rose further to Rs.17.8 crores - an increase of Rs.5 crores over 1974-75."⁸

The cost of production (which included the prices of raw materials, coal, fuel, stores, packing materials and other costs) as a percentage of total value of production went up steadily from 57 per cent in 1971-72 to 63.7 per cent in 1978-79. As a result of this high cost of production, the margin realised was low for a capital intensive industry like cement and withdrawals from reserves were made to maintain the dividend levels of the industry. Between 1965 and 1975, while the All Industry's net worth grew at a rate of between 4.6 per cent and 14.0 per cent, the cement industry had negative rates of growth of upto -5.5 per cent, thus lagging far behind in this respect.

Paid-up capital per company, however, increased over the period from Rs.241 lakhs in 1960-61 to Rs.431 lakhs in 1978-79 and grew at an average rate of 3.2 per cent per annum between 1965 and 1975. The decline in net worth can, therefore, be attributed to the fall in the reserves of the industry.

Ratios of payments in the form of dividends by the industry to various components of the capital structure

⁸ Dr. D.K. Ghosh, "Large-sized Cement Companies in the Private Sector", Company News and Notes, October, 1977, p.3.

show the paying capacity of the industry. The dividend as a percentage of net worth, thus, is a good indicator of whether or not the industry was paying sufficiently in order to attract fresh capital to the industry. In spite of the low operating profits in the industry, the dividend policy has been such as to maintain a payment to the owners of the companies, evidently, at the expense of their reserves etc. In 1974-75, the percentage of dividends to net worth was only 2.3 per cent, the lowest in the period, as against 4.4 per cent by the All Industries category. The highest recorded was 7.5 per cent in 1965-66, a good year for the industry as a whole. In 1960-61, the retained earnings were 12.1 per cent of the profits after tax, and in 1966-67, the retained profits formed 52.6 per cent of the profits after tax. In 1974-75, the year when dividends as percentage of Net worth were very low, the retained earnings as well as the profits after tax were negative - a very adverse year for the industry.

The profitability of the industry has moved with the policies of the Government vis-a-vis prices, etc. The pricing policy aimed at obtaining a fair return to the producers on their capital did not bring about the desired result. The delays in announcing the retention prices and the rising cost of production also affected the profit margin of the industry. In 1979, for example, the new

Table 4.3 : Ratios of dividend payments (averages for the 5 year periods)

Years	Dividend as % of net worth		Dividend as a % PAT		Retained earnings as % PAT	
	Cement	All Indus- tries	Cement	All Indus- tries	Cement	All Indus- tries
1960-1965	7.0	6.0	79.7	62.5	20.3	37.5
1965-1970	6.8	5.4	62.1	64.8	37.9	35.2
1970-1975	5.0	5.2	*	44.4	*	55.6
1975-1979	6.3	5.2	*	57.5	*	42.5

* Unreliable distortions due to negative profit for some years.

Source : Financial Statements regarding Cement from RBI Bulletins.

price formula came into existence 32 days late resulting in a loss of Rs.5 crores to the cement manufacturers.

In Table 4.3 we see the trends of retention of profits. Profits are either distributed as payments to the owners (i.e. shareholders) or retained in the business. In the case of cement, there have been great difficulties in this direction. 1972-73 saw negative retention of earnings i.e. reserves were depleted. 1973-74, 1974-75 and 1976-77 were all negative profit years for the industry. The trends of profitability have been fluctuating.

The gross return on capital employed witnessed an erratic trend. After 1970, this ratio has been constantly below the ratio for All Industries. In fact the guaranteed return of 14 per cent (by the Tariff Commissions, etc.) was only achieved in 1966-67, when it touched 14.1 per cent. The gross return on capital employed in the cement industry fluctuated between values, of 2.8 per cent and 14.1 per cent whereas in the All Industries sector, the amplitude was between 8.5 per cent and 12.8 per cent - a much smaller variation showing more consistent results.

Similarly the gross margin on net sales fluctuated significantly. From 1960 to 1971-72, this ratio was well above that of the industrial sector. In 1966-67, it was 17.4 per cent, the highest for the period. The year 1966-67 was a profitable year for the industry - during

this year even gross profits grew by 46.1 per cent over the previous year after which they declined consistently. After 1972, the ratio of gross profit to net sales followed a declining trend; from 12.3 per cent in 1971-72 to 3.7 per cent in 1973-74. Table 4.4 shows the average trends in the industry.

Often, however, the gross profit of a company does not say much about the actual strength of its financial position. This is because, out of these earnings, a large number of extremely important payments have to be made. These are the taxes, interest on borrowed funds, and then out of what remains, dividends are paid to the shareholders of the undertaking. A company's growth potential is invariably measured by the profits it ploughs back into the concern. These are used, more often than not, for capital investments and expansion of the business, as also for the maintenance of daily operations.

The retained earnings as a percentage of profit after tax indicate the proportion of the profit which is retained in the business. In the case of the cement industry, as we have seen earlier, the retention of profits has been low-with, in fact, negative profits (i.e. losses) during many years.

Often, in situations like these where the funds

generated internally by the operations of the industry are not sufficient, there is recourse to the only alternative i.e. borrowing from institutions, banks and even individuals (in the form of public deposits). This brings us to the question of debt. The financial requirements of the cement industry may be classified under the following heads:

1. Fixed Capital : for establishing new plants and for modernization and expanding the capacity of old ones.
2. Working Capital : for the new and existing units.

The former (i.e. fixed capital) is created from capital issues, capital reserves and long term borrowings, whereas the working capital needs are fulfilled through internal generation of resources and from commercial banks.

The Government having started the scheme of soft loans for the cement industry, the financial institutions, (ICICI, IDBI, IFCI) of the country received a number of application for aid. As of June 1981, 17 applications for the amount of Rs.75.9 crores were sanctioned. These loans are generally used by the industry for fixed capital requirements.

The accepted ratio is the debt equity. 'Debt' is made up of long term borrowings with fixed interest obligations such as debentures and loans. 'Equity' covers share

Table 4.4 : Averages of profit ratios for 5 year periods

Years	Gross Profit as % Net Sales		Gross Profit as % Capital Employed	
	Cement	All Industry	Cement	All Industry
1960-1965	10.4	10.6	9.8	10.2
1965-1970	14.0	9.9	10.5	9.5
1970-1975	8.4	10.4	6.7	10.9
1975-1979	8.0	9.2	8.9	11.0

Source : RBI Bulletins.

capital (ordinary and preference) as well as reserves and is shown as "risk capital".

The use of debt in the financing of an enterprise tends to reduce the cost of capital and thus reduce the overall rate of return to an enterprise. There is a tax benefit derived from the use of debt: the interest payable on debt is a deductible expense for income tax purposes unlike the dividend paid on equity. But debt places a fixed burden on the business by way of interest and principal repayments which may become severe if the earnings of the enterprise are not commensurate and steady.

The purpose of the debt-equity ratio is to indicate the proportion of capital supplied by the owners and thus, the asset 'cushion' available to creditors in the event of liquidation of the company. Thus, the financial institutions, who are the major sources of creditor capital to the industry, would generally frown upon an unusually high debt - equity ratio. A lower ratio would ensure a better turnover of their funds. For the promoters, however, a lower ratio would mean greater control over the funds as also cheaper finance.⁹

The legal and operational basis for the debt equity ratio in India is provided by the Capital Issues Control

⁹ T.K. Velayudham, "The Debt, Equity Ratio", RBI Occasional Papers, December, 1976, Vol. 1, No.2, p. 185.

Act, 1947, and the rules framed thereunder from time to time. These pertain to the cost of capital, the form in which it is raised, the volume of capital to be raised and the timing of any new capital issues. This function is carried out by the Controller of Capital Issues.

The concept underlying the debt-equity ratio is directly related to the role of capital in the operations of business enterprise. The role of capital has to be viewed not merely in terms of its size but with reference to its structure i.e. the categories of capital and the terms on which it is obtained. Given the objective of maximising profits to the owners of business, capital accrual is important and is influenced by the need for the safest and most economic capital structure. Decisions regarding a proper gearing depend on a variety of factors such as the nature of the industry, government policies on taxation, the effectiveness of the capital market etc. This latter probably plays the most prominent part. The capital market for the raising of capital is defined in scope by the perception of investors as to the industry's past performance and future prospects; the cost of capital in the market i.e. interest rates in various terms and conditions; and also the willingness on the part of the investing public to participate in industry.

The equity is directly linked to the profitability of

the industry as well as the dividends declared and we have seen that in cement, some years have been even barren of profits. In 1971-72, 17 companies made a profit of Rs.10.98 crores but in 1973-74, a loss of Rs.1.50 crores was incurred and even ACC skipped dividends completely.

The return on net worth of 12 per cent was decided on in 1978 after the Lavraj Committee proposals and this led to some easing of the situation in the capital market for cement.

The increasing trend of the debt equity ratio is, therefore a point in industry's favour. From 7.5 per cent in 1960-61, the ratio increased four-fold to 27.7 per cent in 1965-66. Upto 1977, the ratio has been higher for the cement industry than for the All Industry level. The highest was at 58.0 per cent in 1974-75 as against 38.7 per cent for the overall industrial sector in the country. This shows the increasing reliance of the industry on external sources of finance thus giving it a broader capital base on which to rely and operate.

Sources of funds are either long term or short term. The long term sources are capital issues, reserves and surpluses, depreciation and long term borrowings from financial institutions, etc.

Long term sources of funds fluctuated widely as a

Table 4.5 : Average ratios for 5 year periods

Year	Debt as % Equity	
	Cement	All Industry
1960-1965	10.2	19.6
1965-1970	40.9	32.6
1970-1975	46.4	37.4
1975-1979	49.7	47.0

Source : RBI Bulletins.

percentage of the total funds and did not show any marked trend over the period. Depreciation was an important source of funds, followed by borrowing. These long term funds were used on gross fixed assets and investments in other industries. The latter did not figure very largely; in fact during most years the investments were negative showing an inflow of funds.

The short term sources of funds are taxation provisions, short term borrowings, trade dues and current liabilities. The percentage of short term sources of funds in the total sources of funds has been much lower than that of the share of long term funds. They are mainly used for inventories, loans and advances, other assets and cash.

The utilisation of short term funds had a tendency to outstrip the availability, indicating the absence of any diversion of short term funds for creation of assets.¹⁰

The clamour for a higher debt equity ratio by the cement industry is probably justified since the motivation for shareholders to invest in the industry has been low, because of the low levels of profitability.

Once the funds have been procured, the efficiency in their use is perhaps the next aim of the enterprise. This is reflected, to some extent, in the magnitude of operations per unit of capital (or assets) held by the business. There has been a wide divergence between the cement industry and the general industry sector throughout the period under consideration. One reason for this is the highly capital intensive mode of production in the cement industry, requiring a larger volume of capital per unit of output produced.

Table 4.6 : Capital efficiency (average for the five year period)

Years	Net sales as % Cement	Net fixed assets All Industry
1960-1965	122.4	226.7
1965-1970	137.9	228.9
1970-1975	169.2	281.4
1975-1979	247.4	326.7

Source : RBI Bulletins.

¹⁰ NCAER, "Cement Industry in India: Problems and Prospects", p. 190.

In cement the ratio reached its highest in 1978-79 at 256.3 per cent even so remaining below the all industry level of 335.6 per cent.

Net sales have shown an increasing trend. From Rs.5,760 lakhs in 1960-61 to Rs.17,349 lakhs in 1970-71 and then to Rs.37,897 lakhs in 1978-79; a seven-fold increase. Net Fixed Assets grew from Rs.5,546 lakhs in 1960-61 to Rs.11,953 lakhs in 1970-71 and then to Rs.14,784 lakhs in 1978-79 a mere two and a half fold increase. This certainly does mean an improvement in capital utilisation, however, poor the absolute level may be as compared to the All Industry utilisations.

CHAPTER V

ACC AND CCI - A COMPARISON

Having surveyed the cement industry as a whole in some of its important dimensions, we will now shift our emphasis to the unit of production. As we have seen, the largest producer of cement has been the ACC. This however shows us only the private sector side and its counterpart in the public sector is CCI - Cement Corporation of India. In this chapter, I propose to evaluate these two firms in the light of their performance, financial make up as well as policies.

In 1936, 11 companies merged to form the 'Associated Cement Companies Ltd.' (ACC), with a clear philosophy "not to attain a monopoly position but to make and deliver cement as cheaply as possible."¹ Thereafter, ACC has been the country's largest producer of cement with an installed capacity of 75 lakh tonnes per annum in 1981-82, accounting for almost one third of the country's total production. The company also follows a progressive policy of innovation despite the problems within the industry itself.

ACC has had a number of firsts to its credit. In

1 ACC, "Data on Cement Industry", 1982, p.1.

1947, the first entirely indigenous cement plant was installed at Chaibasa. In 1959, two new cement products were introduced by ACC - Silvicrete White Cement and Portland Blast Furnace Slag Cement (PBFS). In 1965, the Central Research Station was established. Its functions were to stimulate technology development - both fundamental and applied; to attempt diversification and import substitution.

1979 saw the first Mitsubishi Fluidised Calciner (MFC) commissioned. This technology is a development over the suspension preheater kiln system. It involves additional fuel firing in an independent stationary vessel to achieve a higher degree of calcination of cement raw materials, resulting in higher output of the kiln with the same quantity of fuel. Applied to dry process plants already in operation, capacity can be increased by upto 50 per cent. The greatest advantage of the MFC is that it permits the use of inferior quality coal without affecting the production.

ACC also has on hand a number of consultancy projects both for Indian and foreign clients. This consultancy service handles a range of activities including geographical studies, process designing, EDP systems, project analyses and even training of personnel. The projects covered feasibility studies for cement and

Portland Blast Furnace Slag Cement plants as well as turnkey jobs for clinker grinding and cement plants.

The Concrete Association of India is an offshoot of ACC. Its objectives are to extend and improve the uses of ACC's cements, as well as to promote the use of concrete through lectures, demonstrations, etc. Other subsidiaries are ACC - Babcock Ltd., Associated Tyre Machinery Company Ltd. and Cement Marketing Corporation of India Ltd.

ACC's Research and Development efforts in diverse fields have led to the establishment of its Catalysts and Adsorbents (CATAD) plant, producing a wide range of high technology import substitution products for use in various process industries. Other products developed by ACC's R & D division are acid resistant cement (Accocid), water resistant cement (Hydrophobic) and Portland Pozzolona Cement (PPC).

The Rural Development Department of the company is also very active: operating projects in 43 interior, backward and tribal villages in 7 states. The Rural Development Department aims at providing gainful employment opportunities to the unemployed and making available the basic minimum needs of the community like drinking water, medical care, education, child welfare and community centres. ACC won the Associated Chamber of

Commerce and Industries (ASSOCHAM) Award for 1976 for its "outstanding performance and achievements in promoting rural and agricultural activities."

Cement Corporation of India Ltd.

The Cement Corporation of India was established in 1965 with the objective: "to achieve a pioneering and leading position in the exploration, prospecting and proving of cement grade limestone reserves and deposits to sustain ambitious growth plans of the Corporation in particular and of the cement industry in general."²

The first unit which went into production was the Mandhar Unit, in July, 1970. It adopted the Wet process and in 1978, it was expanded to produce slag cement using the slag from the Bhilai Steel Plant.

Initially, the company was to take "the initiative to set up cement plants in the deficit areas",³ but in 1971, the Planning Commission desired that the restrictions laid down on the Corporation to invest only in the deficit areas might be removed. As a result during the

² Bureau of Public Enterprises, Report, Ministry of Finance, Government of India, 1979-80, Volume II, p.46.

³ 69th Report of the Committee on Public Undertakings, 9th Fifth Lok Sabha, p. 5.

interim years, when the industry was delicensed as well, the Cement Corporation could not avail itself of the advantages in the profitable areas.

Their second plant which went into production was the one at Kurkunta in Karnataka State. Then Bokajan in 1977; Rajban in April 1980; Nayagaon in March 1982. The other units viz. Akaltara, Yerraguntla, Charkhi Dadri (which was taken over by CCI from the private sector on account of its being a sick unit), Adilabad and Tandur being in the process of installation.⁴

CCI has made considerable headway in the field of consultancy. The implementation of the Garampani Mini Cement plant has been entrusted to CCI as a turnkey assignment. Also, raw material investigation was carried out by the Corporation for the North-Eastern Council.

Where social organisation and welfare are concerned, CCI have been extremely conscientious. The establishment of schools and hospitals on site as well as facilities for marketing and entertainment account for a large chunk of the expenditure by the management. As an example, the capital investment per employee during 1981-82 was Rs. 17,217 per annum. Fourteen dispensaries and 15 schools belong to the CCI on all its sites.

⁴ CCI, Annual Report, 1981-82, p. 72.

ACC and CCI - an Evaluation

For this purpose, 5 years have been taken into account. These are 1977-78 to 1981-82. Reference has been made to the relevant Annual Reports of both companies as well as to the Stock Exchange Directory and the Bureau of Public Enterprises publications.

As of 1981-82, ACC had 16 production plants, all of which were members of the Cement Manufacturer's Association. One plant, Gagal, in Himachal Pradesh was under construction however. ACC's total capacity was 75 lakh tonnes per annum. Of the 16 plants, 12 use the wet process of production, 2 use the dry process and 2, the semi-dry.⁵ The oldest plant was Porbandar; however this was modernized in 1966 and the existing oldest plant is the Lakheri plant in Rajasthan established in 1917. The capacity of this plant is 3.56 lakh tonnes and it provides employment to 1721 people. ACC's largest plant is at Jamul in Madhya Pradesh, which has an installed capacity of 13.80 lakh tonnes and uses both the dry and the semi-dry processes (the capacity was increased with the installation of the MFC in 1980).

The CCI had to its credit 6 plants in production in 1981-82; in addition, 3 plants were still in the

⁵ ACC, "Data on Cement Industry", p. 14.

construction stages. The oldest is Mandhar in Madhya Pradesh which went into production in July, 1970. The largest unit is Akaltara, also in Madhya Pradesh, with an installed capacity of 4 lakh tonnes. The proposal to expand the capacities of 3 units by the installation of a pre-calculator was also on the cards.

It is obvious from Table 5.1 that ACC's utilisation of capacity has been higher than that of the Cement Corporation. One of the reasons for this is (as mentioned above already) that CCI, being a new company as well as one which has as its objective the easing of the deficit cement production, has gone into areas which are not the most profitable. ACC had already established itself in the regions close to the sources of limestone and railway lines. Most CCI plants are located in difficult and rugged terrain and transport facilities to and from the plants both for the raw materials and for the finished product are inconvenient. For instance, both Rajban and Bokajan plants are served by ropeways 9 and 18 kms. long to transport the limestone. In 1979-80, the capacity utilisation of ACC was low on account of acute shortages of coal and power. Together, these two factors caused a loss of production of 65.9 per cent of the total shortfall. During this year, the capacity utilisation of CCI was higher than that of ACC as well as that of the industry;

Table 5.1 : Capacity utilisation

Year	ACC			CCI			Industry %
	Production (lakh tonnes)	Installed capacity	%	Production (lakh tonnes)	Installed capacity	%	
1977-78	65	71	91.5	4.42	6.0	73.7	88
1978-79	63	71	88.7	4.83	7.8	71.6	86
1979-80	53	75	70.7	5.95	7.8	76.3	72
1980-81	59	75	78.7	7.95	9.8	81.1	70
1981-82	62	75	82.7	12.51	19.45	64.3	72

Source : 1. ACC, "Data on Cement Industry".
2. Annual Reports.

in fact, after two consecutive years of losses, this was the profit year for them. Although the year 1981-82, appears to have been a bad year for the CCI, it is important to note that its production actually increased by 57 per cent. Installed capacity jumped, almost doubling itself. This was as a result of the addition of a sick plant to the CCI family.

So much for the actual production of the two firms. The cost conditions were a main spoke in the wheel for both companies.

Table 5.2 : Costs per tonne of cement

year	ACC	CCI	Difference (%)	Rs.
1977-78	221	310	40.3	
1978-79	247	357	44.5	
1979-80	319	377	18.2	
1980-81	351	402	14.6	
1981-82	523	530	1.3	

Source : Annual Reports.

Note : The costs include all the expenses incurred by the manufacturer in the production process, viz. raw materials, power and fuel, labour costs, depreciation, etc.

CCI has a higher cost per tonne on the average but

in the case of ACC, the increase over the period was 34.2 per cent as against 17.7 per cent in the case of CCI. Also, the disparity between the two companies reduced drastically from 40.3 per cent in 1977-78 to 1.3 per cent in 1981-82. The average cost, however was higher in the case of the CCI and this could be again because of the location of the plants in inaccessible areas.

The capital intensity of a company is extremely difficult to measure since it does involve some juxtapositioning of facts. This is because in the calculation of assets we are, in effect, clubbing together capital of various vintages. We need to keep in mind, therefore, that CCI is a much newer company than ACC and its capital will naturally be valued higher than that of ACC.

Table 5.3 : Fixed assets per tonne of installed capacity

Year	(Rs. per tonne)			
	Gross Fixed Assets		Net Fixed Assets	
	CCI	ACC	CCI	ACC
1977-78	517	180	424	79
1978-79	525	188	426	82
1979-80	571	209	443	101
1980-81	684	225	548	110
1981-82	666	311	561	184

Source : Annual Reports.

As anticipated, the gross block as also the net block per tonne is greater in the case of CCI. The trend has been an increasing one for ACC as well (72.8 per cent over the period). CCI increased its Gross Fixed Assets per tonne by only 28.8 per cent over the period. A number of plants in CCI had not reached their optimum output thus making for high costs of production.

Table 5.4 : Cost of raw materials per tonne of cement

I t e m	Rs.			
	ACC		CCI	
	1981-82	1980-81	1981-82	1980-81
Limestone	36.8	29.3	43.6	36.1
Gypsum	9.5	7.3	8.4	6.0
Power and Fuel	66.0	51.0	92.0	65.0

Source : Annual Reports - Schedules.

Both firms encountered a rise in the costs of raw materials over the two years. CCI's limestone cost, however, is 19 per cent higher than ACC's. Power and fuel are more expensive in the operations of CCI. This may be attributed to the low capacity utilisation as well as the remoteness of the factories. In terms of physical quantities, both enterprises fulfil the norms laid down by

the BICP⁶ for the consumption of raw materials; 1.6 tonnes of limestone and 0.05 tonnes of gypsum per tonne of cement produced.

Table 5.5 : Cost of raw materials

I t e m	(Rs. per tonne)			
	ACC		CCI	
	1981-82	1980-81	1981-82	1980-81
Limestone	32.7	26.0	42.5	40.7
Gypsum	166.0	141.0	154.0	121.0

Source : Annual Reports.

The cost of limestone to CCI is significantly higher during both years. On the other hand the cost of gypsum to ACC is substantially higher, also for both years. This is because there are only 3 regions which produce gypsum: Rajasthan, Tamilnadu and Gujarat and it has to be transported to all the factories of ACC which are scattered over the country.

To delve further into the operations of the companies, we shall use indicators of efficiency in the employment of labour in the employment of capital and some other accepted norms of evaluation.

⁶ BICP Report, 1979, p. 4.

Table 5.6 : Some indicators of operations

Ratio	ACC		CCI	
	1981-82	1980-81	1981-82	1980-81
Wage/Worker (Rs.)	14747	12623	7354	8659
Output/Worker (tonnes)	215	205	171	228
Labour Cost: Total Cost %	13.1	17.6	6.3	10.6

Source : Annual Reports.

The only possible explanation for the low wage paid by CCI is the fact that most of their plants are located in backward areas and the labour is mainly unskilled. In 1981-82, 42.3 per cent of the work force was either unskilled or semi-skilled. ACC spend a lot on their labour although its productivity is the same as that in CCI (see Table).

The real test of a company's success lies in its ability to make a profit. Taking into account, of course, the service nature of most public sector undertakings, and the fact that the CCI is such a company, we shall endeavour to find a basis for the comparison of the two.

The gross profits of CCI maintained a steady increase although net profits during 1977-78 and 1978-79

were actually negative. ACC faced a decline in its profits because of a fall in sales (production) from 65 lakhs tonnes in 1977-78 to 63 lakh tonnes in 1978-79. Also interest payments were very high on account of higher borrowings by ACC. These increased from Rs.229 lakhs to Rs.348 lakhs, over the same period. There was a spurt in profits in 1981-82, after the announcement of the new price policy for cement. The period between 1979 and 1981 was fraught with inadequacies. In 1980-81, ACC claimed that it lost as much as 7.15 lakh tonnes of cement for want of coal. The factories in South India were badly affected by the labour trouble in the collieries in Singareni. Priority supply was given to railways, power houses, defence and fertilizers and thus there were diversions of coal away from the cement industry. Also, the company's large factories at Shahabad, Wadi, Jamul and Chaibasa suffered power cuts ranging from 15 per cent to 70 per cent imposed by the respective State Electricity Boards.

Table 5.7 compares the two companies in their financial aspects. The recommended 14 per cent rate of return on capital employed or the 12 per cent return on net worth (see Chapter on Prices) were not achieved at all by CCI. This was due to problems with raw materials as well as organisational deficiencies. The year 1979-80 was the

Table 5.7 : Profitability ratios (%)

Year	Gross Profit: Capital Employed		Profit after Tax: Net Worth	
	ACC	CCI	ACC	CCI
1977-78	21.0	0.4	13.7	*
1978-79	15.7	1.1	10.3	*
1979-80	5.1	5.7	1.4	1.3
1980-81	7.0	4.0	3.7	0.4
1981-82	20.4	9.7	37.7	7.4

* Negative numerator

Source : Annual Reports

only year during which CCI's performance was the better of the two. This is because ACC went through a very bad patch that year.

1981-82 saw both companies on a better footing in all respects. CCI had had a chance to establish itself and most of its plants were recording a satisfactory⁷ capacity utilisation and the price situation had eased considerably. Likewise, in the case of ACC, the availability of coal and power had become more regular thus facilitating better production conditions.

This brings us to the question of prices and costs

Table 5.8A: ACC : Cost as percentage of earnings

Item	1977-78	1978-79	1979-80	1980-81	1981-82
1. Raw materials, packing and manufacture	71.17	70.89	74.55	74.55	73.29
2. Employees remuneration	16.83	18.45	18.60	17.41	12.00
3. Depreciation	3.12	3.15	3.72	3.30	2.90
4. Taxes	2.41	1.83	-	-	0.15
5. Interest on Borrowings	1.52	2.16	2.69	3.81	2.81
6. Profits	4.87	3.53	0.44	0.94	8.88
Total	100.00	100.00	100.00	100.00	100.00

Table 5.8B: CCI : Cost as percentage of earnings

Item	1977-78	1978-79	1979-80	1980-81	1981-82
1. Raw materials, packing and manufacture	77.07	76.73	73.94	74.36	68.85
2. Employees remuneration	12.53	12.45	10.31	10.59	6.33
3. Depreciation	9.62	7.9	4.85	5.87	7.00
4. Interest on borrowings	8.51	7.93	6.27	8.06	6.06
5. Profit/Loss	-7.73	-5.02	4.65	1.21	11.75
Total	100.00	100.00	100.00	100.00	100.00

Note : Figures have been grouped to make them comparable.

Source : Annual Reports.

in the industry which affect the profitability of the firms. It should be noted that the basis of the retention price was the assumption of 85 per cent utilisation of installed capacity. The actual utilisation, however was never more than 72 per cent (for the period under consideration) and these prices were therefore rather unreasonable. The example of ACC which is supposed to represent the conditions in the industry, displays the inconsistency in the return on capital employed, and on net worth as required by the government.

From Tables 5.8A and 5.8B we see that payments to employees by CCI are lower than in ACC. Borrowings have made a large dent in the earnings of CCI at a steady 7-8 per cent. On the other hand, ACC has not incurred such large debts, keeping to a conservative 2-3 per cent of the total earnings. Strangely, though, the interest payments as percentages of the total borrowed funds were higher in the case of ACC.

Although the total interest payments as a percentage of the earnings of the CCI are much higher, the rate of interest is significantly lower. This has led to overcapitalisation as a result of the ease with which CCI obtains funds - both from the government as well as from financial institutions. These funds are by and large, on easy terms.

Table 5.9 : Interest as percentage of borrowed funds and loans as percentage of funds

Year	Interest as percentage of borrowed funds		Loans as percentage of funds	
	ACC	CCI	ACC	CCI
1977-78	10.4	6.9	29.1	19.0
1978-79	10.7	2.9	37.2	37.4
1979-80	7.3	2.2	54.2	44.8
1980-81	8.0	3.1	65.8	46.6
1981-82	7.5	5.4	57.9	41.4

Source : Annual Reports

Interconnected with this aspect is the financial make up of the enterprises. The use of other people's money in the world of business is probably the corner stone of business finance. It is often observed that the return on borrowed funds is higher than the cost of these funds. And this leads to an increase in the rate of return on equity. The Debt-equity ratio tells us therefore, the owner's commitment in the business. The guidelines laid down by the Capital Issues Act, 1947 say that a higher ratio than 2:1 was not advisable. However a higher ratio is considered for certain very highly capital intensive industries.

The ratio in the case of ACC has remained above 1:1 practically throughout the whole period. The CCI ratios have been much lower than ACC's; this is because there has been little recourse to long term debt in the case of CCI. Its shares are subscribed to by the government, largely, with little or no obligations to payments of dividends.

Table 5.10 : Debt:Equity ratios

Years	ACC	CCI
1977-78	0.41:1	0.23:1
1978-79	0.59:1	0.59:1
1979-80	1.19:1	0.78:1
1980-81	1.92:1	0.82:1
1981-82	1.60:1	0.75:1

Source : Annual Reports.

In the ACC, the increasing pressure on funds for production as well as for expansion, has led to a rising debt - equity ratio. Also the public's participation in the equity of the company did not increase enough to fulfil the obligations because of the industry's image of low profitability.

The efficiency of the use of the capital thereby procured, is shown in the turnover of the sales per unit of capital. The ratio of Net sales to Net Fixed Assets has been much higher for ACC, although even here it has declined slightly. In both cases however, the ratios have been distinctly lower than the overall ratios for the industry. As we have seen already, manufacture of cement by CCI is done in a more capital intensive way and also that the company is overcapitalised: both these are reflected in the sluggishness of the asset use.

Table 5.11 : Net sales:net fixed assets (%)

Years	ACC	CCI
1977-78	256.3	50.0
1978-79	235.2	49.4
1979-80	189.0	68.1
1980-81	152.2	60.2
1981-82	172.2	68.8

Source : Annual Reports.

The requirements of Working Capital are met generally through the operations of the company. It is calculated as the excess of Current Assets over Current Liabilities. The purpose of working capital is mainly to:

1. provide against danger from a shrinkage in the value of current assets, especially inventory,⁸ and
2. to provide a general margin of safety in the running of the business.

CCI has maintained its operations based on a large base of working capital. It has had a tendency to increase the working capital available although in some years profits were low and even negative. As we have already noted its borrowings as well as its net worth increased (net worth at a rate of 25.7 per cent per annum on an average). This is characteristic of a new company widening its capital base.

Since a part of the liquid assets is the inventory maintained by the enterprise, we examine the changes in this component for the two companies. Effective management of stocks is considered absolutely necessary to the advancement of a concern. This is because the production of output is restricted to the capacity or demand of the consuming public. A perishable commodity like cement, ~~which~~ requires large storage space and facilities to maintain its properties.

⁸ Viscione, "Financial Analysis: Principles and Procedure", Houghton, Muffin and Co., 1977, pp. 12-14.

Table 5.12 : Inventory:sales (%)

Year	ACC	CCI
1977-78	20.4	34.6
1978-79	23.5	41.9
1979-80	29.4	44.4
1980-81	20.7	63.7
1981-82	17.5	38.7

Source : Annual Reports

This is very obviously the case of one company operating on the basis of the offtake of the product and another, merely producing its quota. Though, of course, one of the reasons for the high stockpiling of CCI could be the locations of its plants requiring a larger stock for more economic transportation.

The share capital per tonne of installed capacity is indicative of the wide disparity in the financial make up of the firms. The ACC figure for both years was Rs.44.30. The CCI's share capital per tonne of installed capacity, however, was Rs.988.00 in 1980-81 and Rs.571.00 in 1981-82. The extent to which the CCI has been over-capitalised is clear and no doubt, this could be one of the factors inhibiting its growth.

Thus far where the two companies are concerned. It remains to say that the study is by no means an adequate one on which to base any dogmatic conclusions, but what is very clear from the above is that the industry has need of a public sector enterprise and that with the new policies coming into force, the private sector should receive a fillip to its growth and provide the industry with enough impetus to recover its equilibrium and forge new dimensions.

CHAPTER VI

CONCLUSIONS

It has emerged from the foregoing chapters that the cement industry has had much attention by way of regulation, from the Government. The most recent policy has been one of partial decontrol, which apparently, has given some impetus for growth in the industry. This dual pricing policy has led to some concern on the part of private consumers, because 33.3 per cent of the total production is sold in the open market at a prevailing price of Rs.1400.00 per tonne. The levy cement sells at Rs.724.00 per tonne almost half the price. This disparity in price has resulted in some inconsistencies in the distribution pattern, but, since this is unquantifiable, we shall not go into the matter. The question of whether or not the government should exercise such complete control as it has been doing is a debatable one. It can be argued that in 1966-68 when there was decontrol of the industry, it floundered. On the other hand, at that time, the infrastructure for the distribution of cement was not completely established and the result was the confusion which ensued. From a strict supervision by the STC, to no guidance at all was not the ideal solution.

The other problem is that of raw materials. As it stands, the industry is not a footloose one in that the factories are, by and large, located close to the limestone sites. A change in the distribution pattern has, however, sought to have been established by the creation of split location plants. The production of clinker is then carried to grinding units which are not far from the retail outlets. The advantage of this is that clinker can be transported in open wagons which are easier to come by and not as expensive as the covered ones used for the transport of cement. The problem of availability of coal has been another factor that contributed to the low profitability in the industry. The quality of coal received by the industry was inferior and therefore the production of cement was becoming inefficient. The precalcinator technology has anticipated this problem as it uses inferior grade coal to full advantage. Where power is concerned, the installation of captive power generators in larger plants is being encouraged so that production is a continuous process.

Cement is also being manufactured out of materials other than limestone. Blast furnace slag and fly ash cement are two new developments which utilise waste materials of the steel and power plants respectively. Thus, cement plants are being located in close proximity

to these and the pressure around limestone belts is easing.

Barriers to entry due to the high initial investment cost for a cement plant have created the oligopolistic structure in the industry. Although during the Fifth Five Year Plan, there was a move towards mini-cement plants, this policy has changed. In fact, according to the BICP Report, 1979, the investment cost per tonne for a plant of 600 tonnes per day is Rs.912.00 whereas for a 2500 tpd plant, it is only Rs.614.00. The Economic and Scientific Research Foundation (ESRF) in its publication in 1983 has also stated that larger plants are more economic and competitive in production. This accounts for the increasing concentration in the hands of a few large producers. For example, it is only large houses which can enter the industry, like Larsen and Toubro and Hindustan Levers Ltd., both of whom have just erected cement plants.

The industry is a growing one and as long as the policy makers recognise the need for a freer environment, it appears as though self sufficiency in the production of cement in India is not an unattainable ambition.

BIBLIOGRAPHY

1. Annual Survey of Industries, various Reports.
2. Associated Cement Companies, Annual Reports.
3. Associated Cement Companies, "Data on Cement Industries."
4. Association of Indian Trade and Industry, "Financial Trends and Productivity in the Cement Industry", Bombay, 1959.
5. _____, "Financial Trends and Productivity in the Cement Industry", Bombay, 1963.
6. Bain, J.S., "Barriers to New Competition", Harvard University Press, 1956.
7. _____, "Industrial Organisation", Bombay Macmillan & Co. Ltd., 1959.
8. Berraut, R. and A. Bergson, "Prices of Cement in the Soviet Union, 1928-1950", Rand Corporation, 1955.
9. Brittain, J.A., "Corporate Dividend Policy", Brookings Institute, 1966.
10. Brodie, N., "Report on Portland Cement of Indian Manufacture", Government of India, 1927.
11. Bureau of Industrial Costs and Prices, "Report on Cement Industry", 1979.
12. Cement Corporation of India, Annual Reports.

13. Cement Manufacturer's Association, "50 Years of Progress through Cement, 1914-1964", Bombay, 1965.
14. Committee for Public Undertakings, 69th Report of the 5th Lok Sabha, 1975-76, "Cement Corporation of India".
15. _____, 90th Report of the 5th Lok Sabha, 1975-76, "Action taken on the Recommendations Contained in the 69th Report.
16. Council for Scientific and Industrial Research, "Wealth of India".
17. Davis, E.W. and K.A. Yeomans, "Company Finance and the Capital Market", Cambridge University Press, 1974.
18. Directorate General of Technical Development (DGTD), Annual Reports.
19. Doyle, L., "Inter Economy Comparisons: A Case Study", Cambridge University Press, 1965.
20. Draft 5 Year Plan 1978-83, Volume II, Planning Commission, Government of India.
21. Estimates Committee, 86th Report of the Second Lok Sabha, 1959-60, "State Trading Corpn. of India Ltd.
- 21a. *Est. Com Report of 5th Lok Sabha*
22. Gerald van Herel, "Comparison and Evaluation of Alternative Industrial Technologies,-the case of Cement", Centre for Development Planning, Rotterdam, 1979.

23. Ghosh, A., "Efficiency in Location and Inter-regional Flows", North Holland Publishing Company, Amsterdam, 1965.
24. Guthmann, H., "Analysis of Financial Statements", Prentice Hall of India Pvt. Ltd., 1968.
25. Guthmann and McDougall, "Corporate Financial Policy", Prentice Hall of India Pvt.Ltd., 1966.
26. Hajra, S., "Economies of Scale in Cement Industry", ESRF, Kunj Publishing, New Delhi, 1983.
27. Indian Engineering Association, "Handbook of Statistics".
28. "Indian Industries", 15th Edition, 1980.
29. ICICI, "Financial Performance of Companies", 1978-79, 1979-80, 1980-81, 1981-82, 1982-83.
30. IDBI, Annual Reports.
31. IFCI, Annual Reports.
32. Institute of Cost and Works Accountants, India, "Cost Audit in the Cement Industry", 1969.
33. Iyer, K.V., "Guide to Industrial Approvals", Indu Publications, New Delhi, 1983.
34. Kendrick, J., "Productivity Trends in the U.S." N.B.E.R. Study, Princeton, 1961.
35. Khan, M.Y., "Industrial Finance", Tata McGraw Hill Publishing Co., New Delhi, 1982.
36. Kothari & Sons, "Kothari's Economic and Industrial Guide of India", 1980-81.

37. Kucchal, S.C., "Financial Management", Chaitanya Publishing House, 1969.
38. Lister, R.J., "Studies in Optimal Financing", Macmillan, 1973.
39. Lister, R., and E. Lister, "Annotated Bibliography of Corporate Finance", Macmillan, 1979.
40. Loescher, Samuel, M., "Imperfect Collusion in Cement Industry", Harvard University Press, 1959.
41. Ministry of Commerce and Industry, Annual Reports, 1960-61, 1961-62.
42. Ministry of Commerce and Industry, "Report of the Technical Committee on Cement, August, 1958.
43. Ministry of Finance, Bureau of Public Enterprises, "Annual Reports on the Working of Industrial and Commercial Undertakings of the Central Government", 1976-77, 1977-78, 1978-79, 1979-80, 1980-81, 1981-82,
44. Ministry of Industry, "Guidelines for Industries", 1979-80, Parts I and II.
45. Ministry of Industrial Development, "Report of the Industrial Licensing Policy Inquiry Committee", 1969.
46. Ministry of Law, Justice and Company Affairs, "Joint Stock Companies in India", 1975.
47. National Council for Applied Economic Research, "A Study of Price Controls and Impact of Excise Duty on Selected Industries", 1975.

48. National Council for Applied Economic Research,
"Cement Industry in India: Problems and Prospects",
New Delhi, 1975.
49. _____, "Technological Coefficients for Selected
Industries, 1960 and 1961", New Delhi, 1967.
50. National Productivity Council, "Cement Industry in
France, USA and Britain: A Report".
51. _____, "Productivity Trends in the Cement Industry
in India", New Delhi, 1975.
52. Norman, George, "Economies of Scale, Transport Costs
and Location", Martinus Nijhoff Publishing, 1946.
53. Organisation for Economic Cooperation and Develop-
ment, "Cement Industry in Europe".
54. Paish, F.W., "Business Finance", Isaac Pitman, London,
1961.
55. Raj, A. Besant C. "Public Enterprise Investment
Decisions in India", Macmillan, 1977.
56. Report on Currency and Finance, 1975-76, 1976-77,
1977-78, 1978-79, 1979-80, 1980-81, 1981-82.
57. Reserve Bank of India, "Financial Statistics of
Joint Stock Companies, 1950-51 to 1962-63".
58. _____, "Financial Statistics of Joint Stock
Companies 1960-61 to 1970-71".
59. _____, "Financial Statistics of Joint Stock
Companies, 1970-71 to 1975-76."

60. Reserve Bank of India, "Report of the Study Group to Frame Guidelines for the follow up of Bank Credit", 1974.
61. Rosen, G., "Capital Requirements and Capacity Growth in Modern Indian Industry, Part I - The Cement Industry", Working Draft, 1955.
62. Saluja, M.R., "Input-Output Tables for India", Wiley Eastern Ltd., 1980.
63. Sandesara, J.C., "Industrial Growth in India: Performance and Prospects".
64. _____, "The Indian Economy: Performance and Prospects", Bombay University, Department of Economics, 1974.
65. _____, "Size and Capital Intensity in Indian Industry", Bombay University, Department of Economics, 1969.
66. Stock Exchange Official Directory, Volume 6.
67. Studies on Company Finance - A Supplement to Reserve Bank of India Bulletin, October, 1974.
68. Tariff Commission, Government of India, "Report on Prices of Cement, 1953".
69. _____, "Report on Prices of Cement, 1958".
70. _____, "Report on Prices of Cement, 1961".
71. _____, "Report on Prices of Cement, 1974".
72. Tata Economic Consultancy Services, "Industrial Licensing Policy", 1976.

73. Times Research Foundation, "A Seminar on Price Controller in the Cement Industry", 1983.
74. Van Horne J.C., "Financial Management and Policy", Prentice Hall of India, 1979.
75. Virendra Kumar, "Committee and Concessions in India, 1947-1973."
76. Viscione, "Financial Analysis: Principles and Procedures", Houghton, Muffin & Co. 1977.
77. Whittington, G., "The Prediction of Profitability", Cambridge University Press, 1971.

ARTICLES

1. Arrow, Chenery, Minhas and Solow, "The production function", Review of Economics and Statistics, Vol. XLII, No. 9, 1961.
2. Arya, I.C., "On measuring technological change in cement", Artha Vijnana, June 1981.
3. Chitale, M.P., "Finance for the Private Corporate Sector", Economic and Political Weekly, 16th July, 1983, Vol. XVIII.
4. Ghosh, D.K., "Large Sized Cement Companies in the Private Sector - Financial Performance, 1971-72 to 1975-76", Company News and Notes, October 1977.
5. Gupta, G.S., "Demand for Cement in India", Indian Economic Journal, 1974.

6. Gupta, G.S. "Economies of Scale in Cement Industry in India", Economic and Political Weekly, March 25, 1975, Vol. X, No. 13.
7. Gupta, G.S. and K. Patel, "Location of Indian Cement Industry", Vikalpa, October, 1976.
8. Gupta, V.K. "Concentration and Barriers to Entry in 29 Manufacturing Industries in India", Journal of Industrial Economics, Vol. XVII.
9. Indian Institute of Public Administration, "Functioning of Industrial Licensing System", Economic and Political Weekly, April 30, 1983, Vol. XVIII.
10. Khan, M.Y. "Trends in Industrial Production, 1951-77", RBI Occasional Papers, Vol. 1, No.1, June 1980.
11. Kripa Shanker, "A Study of Capital Output Ratios in the Indian Corporate Sector 1961-62 to 1977-78", RBI Occasional Papers, Vol. 1, No.1, June 1981.
12. Krishnan Kutty, "The Cement Industry", Economic Times, 6th May 1981.
13. Nagaraja Rao B.S. and Kamlesh Chander, "A Study of the Cement Industry in India", RBI Occasional Papers, Vol. 1, No.2, December 1980.
14. Patel, Kirit, "Capacity Utilisation in Cement Industry", Economic Times, 13th May 1976.
15. Ramachandran, "Cement Industry: Urgent Need for Major Measures", Economic Times, 19th December 1980.

16. Reserve Bank of India Bulletins, "Finances of Medium and Large Public Ltd. Cos.", July 1974, July 1976, September 1977, May 1979, May 1980, September 1981.
17. Solow, "Technical Change and the Aggregate Production Function", Review of Economics and Statistics, August 1957, Vol. XXXIX.
18. State Bank of India Monthly Review, "Dual Pricing For Cement", February 1982.
19. "The Cement Industry", Economic Times, 7th May 1983.