

An analysis of profitability trend in Indian Cement Industry

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ABSTRACT

In Indian manufacturing sector cement industry is one of the oldest and established one contributing a large share of total industrial production and employment. Unfortunately however, the industry has long been a victim of various regulatory measures taken by the government on its production and distribution from its time of commencement. These have worsened its competitive structure from the very beginning. The disadvantageous situation of a large number of companies is reflected in the haphazard movement of the industry's profitability ratio. The industry is overburdened with different types of tax imposed by the government. Burden of unfavourable sales tax and excise duty, uncertainty in supply of raw materials, underutilization of capital and high capital cost added to the aforesaid fluctuation in profitability. The lower base of profitability ratios and the waning financial position of the majority of the companies have left them with little resources to undertake renovation and modernization. It is high time that some fiscal measures imposed by the government, together with a drive to modernization be effective for reconstructing the condition of Indian cement industry.

Keywords: Profit, Profitability, Translog Index, Capacity, Production, Capacity Utilization.

During the Second World War demand for cement increased immensely in India, especially from the Government for defense work. The Government appointed a cement advisory council, regional cement advisors and declared cement as an 'essential war commodity'. From that time both the price as well as distribution of cement came under govt. control. The war ended but the controls were continued in one form or other till the industry was partially decontrolled in 1982 and totally decontrolled in 1989.

The price of cement was first controlled in 1942, when Free on Rail destination price was fixed on a 'cost plus' basis. For the period 1946 to 1952 the cost of production of ACC was used as the basis for fixing the cement price. In 1956, the State Trading Corporation acquired the monopoly right to distribute both domestically produced and imported cement. At the same time freight equalization was introduced implying a uniform nation-wide selling price of cement. In 1958, based on a Tariff Commission study, a three-tier retention price scheme was introduced,

with producer prices ranging from ₹ 54.50 to ₹ 80.50 per ton. The three-tier pricing scheme continued up to 1969, at which point retention prices ranged from ₹ 90.50 to ₹ 96.05 per ton. In 1966, the government lifted controls over the distribution of cement, from which point the responsibility for distribution was collectively taken up by cement manufacturers, under the name of Cement Allocation and Co-ordination Organization to control distribution of cement. But this arrangement persisted only for a short period of one year when the government reimposed the distribution control on cement. By 1969, the government replaced the three-tier scheme with a uniform retention price of ₹ 100 per ton. This scheme continued until 1979, at which point the retention price was ₹ 168.91 per ton, when a three-tier scheme was reintroduced. The prices paid to existing units ranged from ₹ 185 to ₹ 220 per ton; however, an added incentive was provided to new units and expanded capacity by way of a retention price of ₹ 296 per ton. This price lasted till early

1982, when the government announced the partial removal of price and distribution controls. At this point, the retention prices for existing units ranged from ₹ 233.39 to ₹ 268.39 per ton. For expansions and new units, the price offered was ₹ 344.39 per ton. In February 1982, the government declared a policy of partial decontrol of cement prices. Under this scheme the existing units were required to sell cement of the amount equaling 66.6% of their installed capacity at a controlled or 'levy price' of ₹ 335 per ton (of ordinary Portland or Portland slag cement). Any production above this levy amount could be sold at whatever price the market would bear. For sick units, the levy quota was set at 50% of capacity, and for units commencing commercial production after January 1, 1982; the levy was set at 37.5% in the first year of operation, 42.5% in the second year and 50% in subsequent years. In the years following partial decontrol minor modifications were made to the existing structure, both by way of periodic increases in the levy price to compensate for various input price increases, and by way of small reductions in the levy quantity. In 1985, for instance, the basis of levy calculations was changed from the rated capacity of the unit to its actual production. Ultimately the levy price regime was ended by 1989 and the government announced a regime of total decontrol of cement prices, thus all units were allowed to sale all of their output according to the free market operation. Though direct government control on cement price was relaxed from 1989 still the government has a close supervision on its price all through. The present study is an attempt to assess the profitability condition of the industry over a period 1980-81 to 2007-08.

Materials and Methods

For purpose of analysis, the data set are collected from journals like Annual Survey of Industries, Reserve Bank of India Bulletin, Cement Statistics published by Cement Manufacturers' Association, Cement Data Book published by Cement Manufacturers' Association, Indian Cement Industry in New Millennium by Ex. Dy. Development Commissioner, Statistical Abstract, Monthly Statistics of Foreign Trade of India. Translog Index of Total Factor Productivity is calculated. Depending upon data provided in Annual Survey of Industry profitability ratio is measured in terms of gross profits as percentage of gross value added. A multiple regression equation of gross profitability ratio on past figures, capital output ratio and percentage of capacity utilization is considered.

Results and Discussions

According to CMA the average retail price of cement per 50 kg bag for the six mega cities of India from Dec 96 onwards are as given in Table 1.

One point must be remembered here that now in India cement prices are purely a function of informal cartels (except in western India where cartels don't survive for long). Western India is an exception because it includes MP and Gujarat. Rajasthan feeds Gujarat, which is cement surplus. Gujarat in its turn has to feed Maharashtra, as the supplier state because it is limestone rich. Southern states feed themselves and are impossibly hard to penetrate. This is the reason why cartel is strongest here. In north Punjab, Delhi, Haryana can't have strong cartel because of

Table 1. Average Annual Retail Price of cement

(₹/50 kg bag)

States	December											
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Mumbai	150.2	157.7	154.6	153.3	161.0	158.5	169.8	156.1	162.1	165.7	161.0	170.0
Delhi	143.0	140.8	132.5	133.1	132.3	135.8	136.0	130.0	133.3	137.0	140.8	141.9
Chennai	141.7	154.9	153.6	152.1	146.3	162.4	164.0	142.7	153.1	160.8	163.7	165.8
Bangalore	141.4	152.5	155.8	153.7	140.1	153.1	159.3	139.5	151.3	154.8	151.7	159.8
Hyderabad	121.2	119.4	119.4	113.8	106.2	132.9	142.6	119.4	117.8	120.9	132.8	140.7
Kolkata	133.1	138.6	135.1	156.6	131.4	144.5	138.4	150.0	157.7	155.8	160.8	163.7

dispatches from Rajasthan. UP does not have many plants but the consumption is taken care of by states, enjoying excess surplus-MP and Rajasthan. Hence, cartel in these states (MP,UP and Rajasthan) is impossible. The cartel decides the floor price and the sales volume by the individual members in a region. So, the biggest beneficiary is the largest player.

Let us try to analyze the behavior of the real price of cement over the period 1980-81 to 2007-08, based on price indices of cement taking 1980-81 as the base period. All the relevant data are given in Table 2.

**Table 2. Annual Changes in the Real Price of Cement
(Based on price indices with 1980-81=100)**

Year	Price Index Base (1980-81)	Growth of Price Index
1980-81	100	
1981-82	115.86	15.86
1982-83	156.45	35.03
1983-84	181.04	15.72
1984-85	198.97	9.90
1985-86	211.86	6.48
1986-87	204.68	-3.39
1987-88	161.33	-21.18
1988-89	154.38	-4.31
1989-90	171.18	10.88
1990-91	200.62	17.20
1991-92	228.44	13.87
1992-93	243.16	6.44
1993-94	244.43	0.53
1994-95	273.06	11.71
1995-96	316.75	16.00
1996-97	325.09	2.63
1997-98	314.09	-3.38
1998-99	311.89	-0.70
1999-00	310.00	-0.60
2000-01	373.00	20.32
2001-02	355.64	-4.65
2002-03	359.55	1.10
2003-04	365.05	1.53
2004-05	383.67	5.10
2005-06	391.78	2.11
2006-07	420.45	7.32
2007-08	445.67	6.00

It is to be noted that there is a total undulation in the series of change in real price. For some years the change is even negative. In 1981-82, the last year before the partial decontrol was implemented, the real price increased by about 16% over the previous year as a result of a higher retention prices set by the government in 1981. This upward movement was even exacerbated in 1982-83, the first year in which the partial decontrol policy was in effect, when the real price of cement increased by about 35% over the previous year. This rise in real price of cement was the highest among all the changes concerned. Starting from the next year the real price of cement fell up to 1988-89. The initial year of total decontrol of cement price i.e. the year 1989-90 was marked with a rise in real price but this trend persisted for a short period of three years only. The initial year of liberalization era was marked with a high percentage rise in real price of cement, which was of the amount of 14%. The remaining years of the present study were witnessed by a total undulation of real price of cement among which two years 1995-96 and 2000-01 corresponded to a sufficiently high level of real price of cement giving rise to 16 and 20% rise over the previous year respectively. Some years even marked with a negative change in real price of cement.

Let us try to note the change in profitability scenario in Indian cement industry over the period 1980-2007.

Profit and Profitability- A Theoretical View

The notion of profit in general refers to the difference between the total revenue accruing from the sales of a commodity and the total cost incurred in producing it. On the other hand the terms profitability implies the extent of capacity of earning profit. In an abstract sense, it may be defined as the quality of being profitable. There are various theories regarding the origination of profit. For example, F.B. Hawley considered profit as the reward for the risk and responsibilities shouldered by the entrepreneur. Frank Knight on the other hand linked the emergence of profit to the unforeseen uncertainties rather than risks, which are known in advance and hence, can be insured. J.B.Clerk in his dynamic theory of profit expressed similar views. Schumpeter attributed the origin of profit to the innovative jobs rendered by the entrepreneur. Again there is a wide view, pioneered by Lerner, which seeks to trace the origin of profit in

the monopoly power of an organization. Despite this multitude of divergent views regarding the origin of profit, there is no lack of consensus regarding the view that it is extremely essential from the point of view of thriving and sustenance of a business organization. This is supported by a statement made by Dean Joel when he remarked, "a business firm is an essential organization designed to make profit and profit is the primary measure of its success". A business organization requires profit for survival, satisfaction, stability and growth even when it tries to achieve a goal other than profit maximization. But there is no unique measurement of profit. It can be gross or net of interest and taxes and can be of a short- term or long- term concept. The net concept corresponds to the notion of retained profit, which influences the firm's or industry's reinvestment potential. The total volume of profit, irrespective of its definition or measurement process, hardly serves as an indicator of efficiency of a business, unless it is related to the scale of business from which it originates. Hence the term profitability measuring gross profit as proportional to gross value added is reckoned with. Now in common view it is generally assumed that a rise in productivity is generally reflected in terms of a rise in profitability ratios. And this seems to be more logical when total factor productivity is considered. When total factor productivity rises, it implies production system has become efficient in terms of smaller amount of overall inputs required to produce unit level of output reflecting decrease in cost per unit output. Now, if sales remain constant and cost falls, then, other things being the same, profitability rises. Again a fall in total factor productivity reflects escalation in cost per unit output. However, if at the same time, demand goes up relative to production or production level goes down, demand remaining the same, then possibly price may go up and if it goes up so high as to outweigh the rise in costs, then profitability ratios may increase despite fall in total factor productivity. On the other hand simply through pressure of trade union wage may shoot up and even capital cost may go up due to installation of lumpy sophisticated machinery. In such circumstances, despite a rising tendency of total factor productivity, cost escalation may be so high that ultimately profitability ratios may decline or may display weak sympathetic movement. Thus one can say that there is no general

rule that total factor productivity and profit ratios should strongly move together. It would possibly happen under *ceteris paribus* case; but if there be changes in surrounding circumstances, the direction and extent of sympathetic movement is placed in uncertainty.

Table 3. Profitability Ratios in Indian Cement Industry

Year	Profits as a ratio of Gross Value Added
1980-81	0.08
1981-82	0.03
1982-83	0.51
1983-84	0.43
1984-85	0.46
1985-86	0.35
1986-87	0.11
1987-88	0.06
1988-89	-0.02
1989-90	-0.13
1990-91	0.27
1991-92	0.44
1992-93	0.12
1993-94	0.04
1994-95	0.17
1995-96	0.41
1996-97	0.11
1997-98	0.11
1998-99	-0.08
1999-00	0.13
2000-01	0.30
2001-02	0.27
2002-03	0.16
2003-04	0.21
2004-05	0.28
2005-06	0.23
2006-07	0.31
2007-08	0.25

Profitability and Productivity - An Empirical Analysis

Having made the above theoretical analysis a study can be undertaken relating to the sympathetic movement of productivity as well as profitability in the cement industry of India. In this context it seems imperative to consider the correlation coefficient between some measure of total factor productivity

and that of profitability ratios in the industry. For this purpose the profitability ratios for the industry are displayed in Table 3 depending on the data from 1980-81 to 2007-2008 from various ASI reports. Total factor productivities are measured in terms of Translog index.

The Translog index of total factor productivity is expressed by the relation $A_{t+1} = A_t \exp(m_{t+1})$, where m_{t+1} is the exponential growth rate of total factor productivity between years $t+1$ and t . For the base year A_t is by definition made equal to one and written as $A_0 = 1$ and

$$m_t = \ln(Y_t/Y_{t-1}) - \{S_{LL_n}(L_t/L_{t-1}) + S_{KK_n}(K_t/K_{t-1})\}$$

Where Y_t , L_t , and K_t are respectively value added, labour input and capital input in year t .

$SL = \frac{1}{2}[S_{Lt} + S_{L(t-1)}]$ and $S_k = 1 - S_L$; S_{Lt} denotes the share of labour in value added in year t .

The production function underlying the Translog index is based on two neo classical assumptions; viz.

1. Constant returns to scale
2. Payments to factors according to marginal product.

Now on the basis of the framework presented in Table 3, the indices of total factor productivity for the cement industry have been constructed with 1980-81 as base which are presented in Table 4.

Now it is thought proper to consider the correlation coefficient between Translog's index of total factor productivity and gross profit as a ratio of GVA as given in Table 3. The aforesaid correlation coefficient yields the value of $r = 0.02$, which is insignificant too. So it may be said that there is no distinct relation between total factor productivity and profitability ratio in case of Indian cement industry. The economic implication of this result is that the profitability in cement industry is to a large extent influenced by factors other than productivity. The small value of the correlation coefficient is accounted for by sharp fluctuations in profitability ratio in the intermediate years, even negative for some years. Several factors may be responsible for the aforesaid fluctuant unsteady behavior of profitability in cement industry around a low value. For instance there occurred a fluctuant per capita consumption up to 1995 as is evident from Table 5 and after that also there is a

sluggish growth in per capita cement consumption. Moreover Table 5 will give more explanations in regard to such an undulation in the profitability series.

Table 4. Total Factor Productivity Indices

Year	Translog Index
1980-81	100.00
1981-82	86.49
1982-83	141.17
1983-84	132.95
1984-85	138.38
1985-86	132.38
1986-87	101.49
1987-88	134.29
1988-89	141.17
1989-90	145.47
1990-91	192.48
1991-92	262.43
1992-93	184.93
1993-94	148.41
1994-95	164.02
1995-96	208.51
1996-97	225.88
1997-98	149.9
1998-99	134.29
1999-00	172.43
2000-01	314.19
2001-02	145.47
2002-03	123.96
2003-04	167.67
2004-05	201.78
2005-06	230.89
2006-07	198.09
2007-08	215.56

It is clear from the Table-5 that capacity and production both are increasing at a rapid rate. Though production could never match the capacity generated. Moreover there is always a fluctuation in the capacity utilization level. Several reasons may

be responsible for the lower utilization of capacity in 1980s. A no. of firms with one million ton capacity commenced production in 1980s. Many of these firms experienced teething problems due to the size of the kiln and the balancing equipment installed. The obsolescence and aging of plants requiring modernization affected the total output in some firms. Moreover power cut / tripping in the states affected the production of cement industry to a large extent. Coal used was of a poor quality. So both the internal and external factors are responsible for the apparent paradox in profitability behavior.

Table 5. Capacity, Production, Consumption and Capacity Utilization in Cement Industry

Year	Capacity (Mn. T)	Production (Mn. T)	Per Capita Consumption (kg)	Capacity Utilization %
1981	28.87	20.77	33	71.94
1982	31.78	22.54	33	70.92
1983	35.86	25.41	36	70.86
1984	39.10	29.14	41	74.52
1985	41.85	31.11	39	74.33
1986	49.10	33.65	44	68.53
1987	54.28	36.97	47	68.11
1988	54.81	40.72	50	74.29
1989	56.13	42.07	54	73.95
1990	57.89	44.87	57	77.51
1991	60.61	49.48	63	81.63
1992	62.46	50.87	61	81.44
1993	66.90	52.78	62	78.89
1994	73.19	57.57	65	78.66
1995	82.06	62.08	72	75.65
1996	90.17	68.86	78	76.36
1997	99.92	74.75	82	74.81
1998	106.00	79.42	85	74.92
1999	109.44	91.72	97	83.81
2000	117.32	95.95	99	81.78
2001	133.41	98.35	100	73.72
2002	137.86	109.59	106	79.49
2003	144.98	115.36	110	79.57
2004	142.21	119.81	116	82.25
2005	145.78	125.91	121	86.37
2006	155.98	130.76	128	83.83
2007	164.89	137.89	134	83.62

It is true that production cost determines to a large extent the price competitiveness of firms. Freight cost is the single largest cost element for any cement company. The industry is heavily dependent on inputs with administered prices such as coal, power tariff, freight, royalty and cess on limestone. Power and fuel account for more than 75% of the cost of production. Coal is a basic input in cement production, which is used both in its production either as a raw material or as fuel. So both the quantity and quality of coal are important in cement production. Non-availability of good standard of coal in required amount affects the cost structure of a cement plant. In order to produce good quality of cement many firms have to import coal of high calorific value, which added to total cost. Further, high royalty is payable for limestone consumption. Sales tax coupled with excise duty accounts for a considerable percentage of the selling price. Since cement industry depends mainly on different types of minerals that are not distributed evenly over the country, plants have to bear a heavy amount of transport cost to collect all the required materials either carrying these by road or by rail. Transportation is a very crucial element for the industry with markets for any plant being in a radius of 250-600 kms from the plant. Some cement plants have set up dedicated jetties for promoting bulk transportation and export. The govt. has notified the cement industry as one of the end-users entitled to operate their own captive coal mine. Many cement plants have shown interest for taking up coal blocks on lease and to operate the coal mines. The coal and lignite industry were de-licensed with effect from 8th June 1998. But all these are responsible for rise in capital expenditure, which in its turn are responsible for raising cost structure of a cement plant, which again in its turn affect the gross profitability ratio.

Fluctuation in the infrastructure bottlenecks in the intervening years have been no less contributor to such ups and downs in the profitability performance of the cement industry. The extent of frequency of power cuts and load shedding in various states in the country has in many cases led to capacity under utilization. Some large plants have to engage in captive power generation, this also led to increase in capital expenditure, thus affecting viability of the production in terms of profitability. Hence the correlation between this series of profits as percentage of gross value added and the total factor

productivity ratio would have yielded a still lower figure.

At this juncture it seems imperative to fit a semi log linear trend in the form of $\log Y = a + bT$ to the gross profitability ratios. The estimated trend rate of growth comes to be 0.005, which is really very small and is also found to be insignificant from the corresponding value of $t_{21} = 0.196$. The implication is that cement industry hardly registered any significant rise in profitability performance over the years concerned. The scene would have become even disastrous if one had focused attention on the nature and figure of profits after tax as percentage of gross value added.

Difficulties Encountered by the Cement Industry

There are certain specific factors which have no less effect on the overall performance of cement industry. Strict govt. regulations imposed on the production of the industry for a long time from its commencement and several restrictions such as entry into and exit out barrier of the industry virtually robbed of its freedom to cater to the public demand. Besides this the existence of excess capacity in an environment of control imposed on exit virtually led most of the existing firms to carry on production at sub optimal level. Similarly except a few most of the minis are unable to exploit the fruit of technology exclusively adopted for them and thus are operating at a below optimal level. Only a few relatively new ones of Indian majors compare favorably to the world majors in terms of profitability.

Some Determinants of Profitability

The present study relates to the time series of profitability corresponding to the all-India pattern of the cement industry, so it is thought proper to shed off the variables which relate to pure firm characteristics and opt for past profitability and capital-output ratio as the two important determinants of profit. We would have opted for total factor productivity as well, but since the correlation coefficient between total factor productivity and profitability is small, it is left out, being considered as relatively unimportant.

On the basis of persistence hypothesis, it is held that in a matured industry like cement in India, maintenance of present profits would to a great extent be guided by past profitability ratios. In other words it is

expected that the industry as a whole would at least try to achieve the profitability level of the previous year. Again higher capital output ratio is considered as co-variant with modern technology and as much as expected to raise the levels of profitability through efficient and labour saving methods. However if the capital cost be abnormally high compared to labour or if the capital be not optimally used or if is used by inefficient workers, then the direction of movement of profitability ratios is put in doubt.

Given the above theoretical basis, a multiple regression equation of gross profitability ratio on past figures, capital output ratio and percentage of capacity utilization is considered as:

$$X_1 = a + b_1X_2 + b_2X_3 + b_3X_4$$

Where $X_1 = P_t$ (profitability ratio for the current period)

$X_2 = P_{t-1}$ (profitability ratio for the previous period)

X_3 = capital-output ratio

X_4 = percentage of capacity-utilization

Table 6. Multiple Regression Analysis of Gross Profitability Ratio on Past Figures, Capital-Output Ratio and Percentage of Capacity Utilization

	b	t	Sig	R2	F
Const	0.661	0.924	0.368	0.392	3.864 (0.027)
X_2	0.296	1.576	0.103		
X_3	-0.101	-2.784	0.012		
X_4	-0.003	-0.284	0.780		

Note: (1) The regression coefficient of X_2 is significant at 10.3% level of significance.

(2) The regression coefficient of X_3 is significant at 1% level of significance.

(3) F- value is significant at 2.7% level of significance.

Table 6 reveals that past profits have a significant positive influence on current profitability. However the impact of capital-output ratio on profitability is negative as well as significant, contrary to the general expectations. The explanation possibly lies in underutilization of capital, relatively higher capital cost, inefficient handling by inadequate skilled labour etc. No definite conclusion can be made regarding the influence of capacity utilization on present state of profit-output ratio since the corresponding regression coefficient is negative

Table 7. Trend in Financial Position of Selected Cement Companies

Trend Values	PBDIT as percent of sales	PBDIT as percent of capital employed	Working Capital (₹ Crore)	Long term borrowings (₹ Crore)	Interest paid (₹ Crore)
Positive	4	3	11	11	10
Negative	9	10	2	2	3

PBDIT- Profits Before Dividend, Interest, Tax

as well as insignificant. There may be many other factors (not easily quantifiable) the impact of which is left uncared for in this regression. The value of R^2 confirms this conclusion, which again in its turn is supported by the 2.7% significant level of F- value. But from this only, a model could not be judged, as Gujrati argues "The researcher should be more concerned about the logical or theoretical relevance of the explanatory variables to the dependent variable and their statistical significance. If in this process we obtain a high R^2 , well and good; on the other hand if R^2 is low, it does not mean the model is bad."

Moreover it is also to be noted that although past profitability ratios have a significant impact on current profitability, the ratios themselves have remained low over time. There is left little resource or retained profit to meet the increasing demand of working capital renewal of fixed assets when time came for its replenishment.

Table 7 compiled from data available by CMIE corresponding to thirteen selected companies of different status (public as well as private) producing cement over the period 1990-2007, bear enough evidence of the waning financial position of the industry.

Table 7 gives trend values corresponding to five important financial statuses of the selected companies in the industry. The trend values corresponding to each of the measurement of financial status of the companies are divided into positive and negative segments. It is clear that profitability of most of the considered companies have been generally on a decreasing trend as is evident from the 2nd row corresponding to column 2 & 3. On the contrary, the working capital requirements of most of the companies have been increasing with rise in price level. Unable to meet the requirements of working capital on their own most of the selected companies have no alternative than to resort to borrowed

capital on an increasing scale over time along with rise in interest burden during the aforesaid period. As a result the industry burdened with rising debt over time could hardly generate resources sufficient to carry through the programme of modernization and renovation of existing plants and machinery in an efficient manner. The result is formation of new mechanized, consolidated and efficient large houses to avail the fruit of rising price and production of the commodity.

Summery and Conclusion

The disadvantageous situation of a large number of cement firms is reflected in the haphazard movement of the profitability ratio (measured by gross profits as a percentage of Gross value added). The sharp fluctuations in the profitability ratio have produced a smaller degree of covariation between the above series and that of total factor productivity indices which displayed an increasing trend. A number of factors contributed to the aforesaid fluctuations. The per capita consumption of cement series shows a fluctuating behavior up to a certain time followed by a sluggish improvement in it, this together with a slow growth rate of export of cement may be responsible for the insufficient growth rate of profitability. Besides this, frequent power cuts and poor availability of proper quantity and quality of coal, high rate of sales tax and excise duty together with high rate of govt. administered prices for most of the inputs are also responsible for such an undulation in profitability ratio. Results of fit of multiple regression equation of profitability ratio on its past values, capital output ratio, and percentage of capacity utilization yields a positive significant influence on profitability by its past values. However capital-output ratio has, contrary to expectations, get a negative influence. This is perhaps due to underutilization of capital, relatively high capital expenditure, inefficient handling of the machineries etc. The lower base of

profitability ratios and the waning financial position of the majority of firms have left them with little resources to undertake renovation, modernization and adoption of improved technology as the few new firms can.

Policy should be undertaken such that the unused capacity created by the firms can be materialized. An intervention from financial institutions of both government and non-government organizations is needed to increase the demand of the product for domestic consumption by development of rural areas and ensure the soft loan facility to the rural people. Public Private Partnership model can be encouraged intensively for constructional development such as construction of expressway, building up of bridges, and big passes. The part of cement used in social overhead can be exempted from excise duty and sales tax. Govt. can lower the administered price of most of the inputs used in its production. On the other hand, policies can be taken to enhance the use of blended cement in major projects in order to

make its production more cost effective. By lowering the power tariff laid on it and removing cess on captive power generation the price of cement can be reduced. Using R & D programme it can be tested that instead of electricity and coal whether no ash fuel such as natural gas can be used in its production. Indian cement companies should be encouraged to adopt global quality testing procedures, for setting up the standard for globally acceptable ones. Global funding sources should be allowed to enter in to meet the capital requirement of the industry.

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