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**PERFORMANCE OF INDIAN CEMENT INDUSTRY:  
THE COMPETITIVE LANDSCAPE**

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<b>Abstract</b>	
<p>The cement industry is experiencing a boom on account of the overall growth of the Indian economy primarily because of increased industrial activity, flourishing real estate business, growing construction activity, and expanding investment in the infrastructure sector. The performance of the industry, under different policy regimes, truly establishes that decontrol of the industry and liberalization of the economy has led to remarkable improvement in the indicators such as installed capacity, capacity utilization, per capita consumption and exports. The industry experienced a complete shift in the technology of production, from wet process to dry process.</p> <p>The competitiveness among the firms in Indian cement industry has also been evaluated. For the year 2006-07, out of the sample of seventeen firms (90.21% of the total market share), about 47% have recorded above industry average performance in the overall competitiveness index. The marginal difference between the competitiveness of different firms reveals the tough competition in the industry.</p>	
<b>Key Words:</b> Cement, History, Evolution, Decontrol, Performance, Competitiveness, Financial- Non Financial, Regional Dynamics.	
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## **PERFORMANCE OF INDIAN CEMENT INDUSTRY: THE COMPETITIVE LANDSCAPE**

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### **1. INTRODUCTION:**

Cement is an essential component of infrastructure development and most important input of construction industry, particularly in the government's infrastructure and housing programs, which are necessary for the country's socio-economic growth and development. It is also the second most consumed material on the planet (WBCSD 2002). The Indian cement industry is the second largest producer of cement in the world just behind China, but ahead of the United States and Japan. It is consented to be a core sector accounting for approximately 1.3% of GDP and employing over 0.14 million people. Also the industry is a significant contributor to the revenue collected by both the central and state governments through excise and sales taxes.

#### **1.1. Structure of the Industry:**

The characteristics of the Indian cement industry need to be discussed to understand its structure better. Firstly, it is a combination of mini (more than 300 units) and large capacity cement plants, where majority of the production of cement (94%) in the country is by large plants. The conventional method of cement manufacturing used by large plants (Rotary Kiln) needs high capacity, huge deposits of lime stone in its vicinity, high capital investment and long gestation period. Hence mini cement plants based on Vertical Shaft Kiln technology, suiting the small deposits of limestone are becoming popular. Also they create less environmental pollution. Against the requirement of Rs. 3500 per tonne of capacity of large plants, capital costs for mini-cement plants come to about Rs. 1,400 to Rs. 1,600 per tonne (ICRA 2006).

The viability of the location plays a major role in the economics of cement manufacturing (Schumacher and Sathaye 1999). One of the other defining features of the Indian cement industry is that the location of limestone reserves in select States

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has resulted in it's evolving in the form of clusters. The proximity of coal deposits constitutes another important factor in cement manufacturing. Since cement is a high bulk and low value commodity, competition is also localized because the cost of transportation of cement to distant markets often results in the product being uncompetitive in those markets. There are at present seven clusters, where Satna (Madhya Pradesh) cluster is the leader in capacity as well as production (CMA 2007). Others are Chandrapur (North Andhra Pradesh and Maharashtra), Gulbarga (North Karnataka and East AP), Chanderia (South Rajasthan, Jawad and Neemuch in MP), Bilaspur (Chattisgarh), Yerraguntla (South AP), and Nalgonda (Central AP).

Traditionally, cement has been a heavily taxed sector with both the central and the state governments levying the taxes which amount to around 30% of the selling price of cement or around 70% of the ex-factory price (excluding local transport and dealer margins) (ICRA 2006). The major taxes/ levies comprise central excise duty; sales tax levied by the respective state governments; royalty and cess on limestone and coal; and, duties on power tariff. The excise duty rates on cement are on specific basis, as against ad valorem rates on most products.

The cement industry is energy intensive and thus power costs form the most critical cost component in cement manufacturing, of about 35% to total cost of production. The issues here is the technology used (dry versus wet process), fuel efficiency (efficient use of coal/lignite/any other material used for burning) and power efficiency (power availability, use of alternative fuels, unit power consumption, cost and availability of captive power). The scope for cost reduction through better energy efficiency may now be limited for better performing companies since they have already reached the best feasible levels. One more characteristic of the industry comes from it being capital intensive. Since the capital intensity of a new cement project is high, access to capital has become a significant entry barrier. The cost of a new cement plant can be equivalent to about 3 years of revenue (WBCSD 2002).

Another distinguishing characteristic comes from it being cyclical in nature as the market and consumption is closely linked to the economic and climatic cycles. In India, cement production normally peaks in the month of March while it is at its lowest in the month of August and September. The cyclical nature of this industry has

meant that only large players are able to withstand the downturn in demand due to their economies of scale, operational efficiencies, centrally controlled distribution systems and geographical diversification. Lastly, it is worth mentioning that cement industry has a significant role in the climate change debate and issue of sustainable development. The cement industry produces 5% of global man-made carbon dioxide, a major gas contributing to climate change (WBCSD 2005). In short, the main environmental challenges facing the cement manufacturing industry are (Environment Agency 2005), releases to air of oxides of nitrogen, sulphur dioxide, particulates and carbon dioxide, use of resources, especially primary raw materials and fossil fuel and generation of waste.

## 1.2. Evolution of the Indian Cement Industry:

The story of the evolution of the Indian cement industry is rather long, where it has seen many ups and downs, but finally has arrived in its maturity stage as it is beginning to gather the benefits of its decontrol by the government in 1989-90.

### 1.2.1. Invention of Cement

Ever since civilizations first started to build, the world has sought a man made bonding material that would bind stones into a solid, formed mass. During the *Paleolithic Age*, men used to enjoy adequate shelter provided by nature. The *Bronze Age* witnessed the use of building materials from a clay based mixture and air hardening lime. The *Egyptians* advanced to the discovery of lime and gypsum mortar as a binding agent for building such structures as the Pyramids. The *Greeks* made further improvements and finally the *Romans* developed cement that produced structures of remarkable durability (Cement Association of Canada 2006). The secret of Roman success in making cement was traced to the mixing of slaked lime with Pozzolana, a volcanic ash from Mount Vesuvius. This process produced cement capable of hardening under water. During the *Middle Ages* this art was somehow lost.

In the 18<sup>th</sup> century, big efforts started in Europe to understand why some limes have hydraulic properties (Cimenterie Nationale 2007). John Smeaton often referred to as ‘father of civil engineering’ in England concentrated his work in this field and

made the first modern concrete by adding pebbles as a coarse aggregate and mixing powered brick into the cement in 1759. A number of discoveries followed. It was in 1817 that Louis Vicat conducted work on the hydraulic nature of the lime-volcanic ash mixture. He was the first person to accurately determine the proportions of limestone and silica required to make the mixture of cement. He published the results of his research, but did not apply for a patent. Finally, in 1824 Joseph Aspdin patented the basic process of slower-setting cement. He addressed this as 'Portland cement' due to the fact that in appearance and hardness, it resembled the upper Jurassic rock found in the region of Portland, in southern England (Lafarge 2004).

### **1.2.2. The Beginning of Indian Cement Industry**

The attempt to produce cement in India dates back to 1889 when a Calcutta firm attempted to produce cement from Argillaceous (kankar). But the first organized effort on mass scale to manufacture Portland cement commenced in Madras (Washermanpet), in 1904, by South India Industries Limited (Cement Manufacturers Association 1964; Gadhok 2000). The factory could not succeed hence it failed. However, it was in 1914 that the first commissioned cement-manufacturing unit in India was set up by India Cement Company Limited at Porbandar, Gujarat, with an installed capacity of 10,000 tonnes and production of 1000 tonnes. Subsequently two plants; one at Katni (M.P.) and another at Lakheri (Rajasthan) were set up. The First World War gave positive stimulus to the infant industry. The following decades saw increase in number of plants, installed capacity and production. This period can thus be called the Nascent Stage of Indian cement industry.

The problem of supply outstripping demand was significant in early period of the industry. Problem of disposal of cement was aggravated by the prejudice with which indigenous cement was regarded. This was followed by a price war between the producers where they resorted to cutting down of prices and selling at below production cost. This situation forced many companies into liquidation.

It was then when the government of India intervened into the market and referred the cement industry to the Tariff Board. The board recommended protection by government and cooperation among existing cement units. All these events

resulted in formation of Indian Cement Manufacturers' Association in 1925 whose main function was to regulate prices in the industry. In 1927, Concrete Association of India was formed whose two main objectives were to educate public about the use of cement and to play an active role in popularizing Indian cement. The next step in the direction of rescuing cement industry was the formation of Cement Marketing Company of India Limited in 1930 to promote and control the sale and distribution of cement at regulated prices.

After all these initiatives, the sales increased along with more plants. In 1936, eleven companies, except Sone Valley Portland Cement Company Limited, merged to form Associated Cement Company Limited (ACC). In 1937, Dalmiya Jain Group set up five factories with installed capacity of 575000 tonnes and ACC added four more plants. With all these expansions, price war again started off which resulted into a significant decrease in prices. But in the post world war period, setting up of Department of Planning and independence of the country provided fresh impetus to the industry.

The price and distribution control system on cement, implemented in 1956, aimed at ensuring fair prices to producers and consumers all over the country, thus reducing regional imbalances, and at reaching self-sufficiency within a short time period (Schumacher and Sathaye 1999). Although due to slow growth in capacity expansion and rising cost in the industry, the government had to increase the fixed price several times. However, these price increases as well as financial incentives to enhance investment, showed little effect on the industry. In spite of the fact that government exercised no control over the Indian cement industry all through the Third Five Year Plan (1961-1967), growth was low due to inadequate retention price and lack of adequate financial resources to the existing companies.

### **1.2.3. Control Period (1969-1982)**

The Indian cement sector had been under strict government control for almost the whole of the period. Government intervention took place both directly and indirectly. Direct intervention happened in the form of government control over production, capacity and distribution of cement, while indirect intervention took the

form of price control. During this period, many companies and their plants started off but still growth was not seen at the desired rate. In 1977, higher prices were allowed for cement produced by new plants or major expansions of existing plants. Due to maintained slow development, the uniform price imposed by the government, was substituted by a three-tier price system in 1979. Different prices were assigned to cement produced in low, medium and high cost plants.

However, further increases of input costs could not be neutralized adequately. Thus, controlled price did not reflect the true economic cost, and profit margins reduced increasingly, preventing essential investments in capacity and production expansion. A permit system introduced by 14 states and union territories in the period comprised direct control over public distribution of cement to ensure fair supplies to priority sectors. However, the system resulted in artificial shortages, extensive black marketing and corruption in the civil supply departments of the government.

The system of price control was accompanied by a policy of freight pooling. The price control fixed a uniform price according to estimated production costs at which cement was required to be sold all over the country. This price contained a freight component that was averaged over the country as a whole. This freight pooling system promoted equal industrial development all over the country. It supported regional dispersion. Yet, it also implied that producers had no incentive in locating production such that transportation costs of cement would be minimized. Market distance became a less important issue. As a result of non-optimal location of industries, average costs of production as well as demand for scarce railway capacity for transportation increased.

#### **1.2.4. Partial Decontrol (1982-1989)**

On account of the above-mentioned difficulties in the cement industry the government of India introduced a system of partial decontrol in 1982. A levy quota of 66.60 % for sales to government and small house builders was imposed on existing units while for new and sick units a lower quota at 50% was established. The balance of 33.40% could be sold in the free open market to general consumers. A ceiling price was set for sales in the open market in order to protect consumers from unreasonably

high pricing of cement. Under the system of partial decontrol, freight pooling no longer covered non-levy cement. Furthermore, specific mini units were completely freed from price and distribution controls. Although overall profitability increased substantially immediately after the introduction of partial decontrol, profits obtained through non-levy sales decreased with greater availability of cement in the market and continuously rising input costs.

To sustain an accelerating course, the government subsequently introduced changes in levy obligations and retention prices regularly. As a result, in 1988 the levy quota was as low as 30% for units established before 1982 and the retention price had increased substantially. In 1987, the Cement Manufacturers Association and the government decided that there was no further necessity for a maximum price ceiling.

#### **1.2.5. Total Decontrol (1989 onwards)**

Finally in 1989, the cement industry was considered to be prepared for free market competition, and all price and distribution controls on sale of cement were withdrawn. The system of freight pooling was abandoned and a subsidy scheme to ensure availability of cement at reasonable prices in remote and hilly regions of the country was worked out. The industry was then de-licensed in July 1991 under the policy of economic liberalization. By removing all controls on the cement sector the government hoped to accelerate growth and induce further modernization and expansion investments. It was after this decontrol that the Indian cement industry moved towards globalization, with increasing emphasis on the exports. The expansion of the industry was evident after the decontrol where capacity as well as production increased many fold. Growth was seen from 91 plants and 43 million tonnes of production in 1989-90 boosting to 132 plants and 161.66 million tonnes production in 2006-07 (CMA 2007). Total capacity utilization for the industry has also increased from 78% to 91% during the same period. The evolution of the industry during various *Five Year Plans* (at the end of plan) can be seen in the following Table 1.

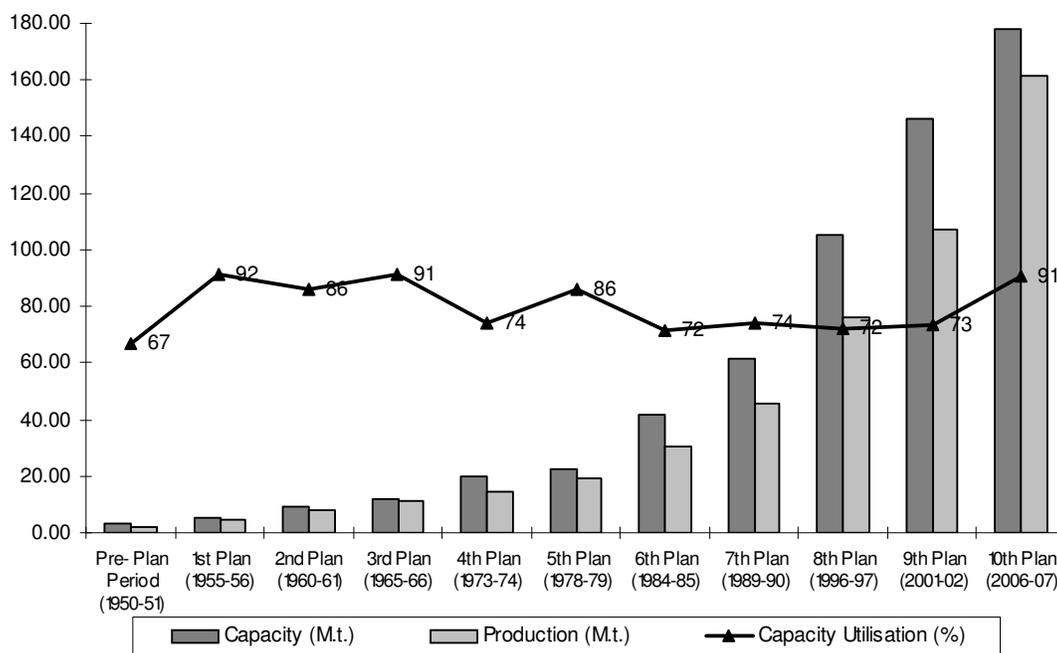
Hence, the history of the Indian cement industry indicates the role of government played in influencing the twists and turns in the industry. It might be noted that government interventions have been a mix of fiscal instruments and direct

control on production, pricing and distribution on the one hand and technological intervention through government promoted research institutions on the other hand.

**Table 1: Growth of Indian Cement industry (at the end of the Five Year Plan)**  
(Including mini and white plants)

End Year of the Plan	Capacity (M.t.)	Production (M.t.)	Capacity Utilization (%)
Pre- Plan Period (1950-51)	3.28	2.20	67
1st Plan (1955-56)	5.02	4.60	92
2nd Plan (1960-61)	9.30	7.97	86
3rd Plan (1965-66)	12.00	10.97	91
4th Plan (1973-74)	19.76	14.66	74
5th Plan (1978-79)	22.58	19.42	86
6th Plan (1984-85)	42.00	30.13	72
7th Plan (1989-90)	61.37	45.42	74
8th Plan (1996-97)	105.26	76.22	72
9th Plan (2001-02)	145.99	106.90	73
10th Plan (2006-07)	177.83	161.66	91

Source: CMA



**Figure 1: Trends in Cement Industry during Five-Year Plans**

The paper is organized such that after the introductory discussion on the Indian cement industry, the second section deals with the performance of the industry especially after its decontrol in 1989. Section three examines the increased competitiveness of firms in the industry as a result of greater consolidations and influx of foreign firms after favorable policy changes. This section is followed by conclusion.

## **2. PERFORMANCE OF THE INDUSTRY:**

Price and distribution controls lifted on 1<sup>st</sup> March 1989 and licensing abolished since 25th July 1991, gave fresh impetus to the key infrastructure industry. However, the performance of the industry improved all the more after late 1990s guiding it to newer heights. The process of improvement in key performance indicators of the industry can be analyzed during changing policy regimes of the government. All the indicators are grouped into primary and other indicators, which clearly reflect the status of the industry in control and decontrol periods. For the purpose the main data source is the Cement Manufacturers Association (CMA).

### **2.1. Primary Indicators:**

In order to study the growth in main indicators, Annual Compound Growth Rates (ACGR) is computed as per the *semi-log method* for 37 years from 1970-71 to 2006-07. The *kinked exponential growth model* (Boyce 1986) is also used to estimate the growth rates for the two sub-periods i.e. 1970-71 to 1988-89 which reflect the control period and 1989-90 to 2006-07 representing decontrol period.

#### **2.1.1. Installed Capacity**

The installed capacity of the Indian cement industry has continuously shown an increase over the period. The industry started with 0.0010 million tonnes (m.t.) of installed capacity in 1914 and reached 3.28 m.t. in 1950 and 9.30 m.t. in 1960. The growth in the capacity has been traced from 1970 onwards when the industry fell in the hands of government control. In the period between 1970-71 and 1988-89, the installed capacity of the cement industry grew from 17.61 m.t. to 58.97 m.t. at the ACGR of 7.47%. This remarkable growth in the capacities was due to producers' expectation of growing markets. But due to various controls and lack of adequate demand, the growth of the industry was not noticed on the desired rates. This resulted in oversupply and low capacity utilizations. Following this, the period after total decontrol till 2006-07, the capacity addition although increased at rates approximately equal to previous period at 7.09% annually, it could hardly match the pace. This was although good for capacity utilizations as production increased at greater rates. The ACGR in the total period of 1970-71 to 2006-07 is calculated to be a decent 7.28%.

### 2.1.2. Production

The production figures of the Indian cement industry tell a different story (Table 2). When the industry started in 1914, production was mere 0.0001 m.t. of cement. This slowly increased to 1.5 m.t. in 1940 and 2.2 m.t. in 1950. The following two decades witnessed enough production making it 14.40 m.t. in 1970-71. The period from 1970-71 to just before decontrol and delicensing of the industry i.e. till 1988-89, the production saw ACGR of 6.69%, just below the growth rate in installed capacity. This indicated oversupply, because of which whole of the industry suffered. The next period of decontrol, though compensated for this excess. Here the ACGR is seen to be 8.09%, well above the previous rates, which is also more than the growth in installed capacities of 7.09%. The annual growth rate for the total period during 1970-71 to 2006-07 is good 7.39% (Table 3).

### 2.1.3. Capacity Utilization

The trend in capacity utilization of the industry is interesting to analyze, as there are many fluctuations all through the period. Starting with 10% in the beginning of the industry, the capacity utilization peaked to around 99% in 1937-38. But this could not be sustained and the capacity utilization fell sharply to 67% in 1950, improving marginally in the following two decades. The period of controlled market, as mentioned before was characterized by oversupply in the industry, which got reflected in negative ACGR of -0.73%. Whole of the period of 1970-71 to 1988-89 saw fluctuations, moving utilization levels to as low as around 65% in some years. But after total decontrol, there was some sort of upturn in this trend due to increased production levels and the ACGR went up to positive 0.93%. It may be mentioned here that the capacity utilizations have been at their highest only after 1999-2000 when it reached 85% and moreover after 2004-05. In January 2007, it even went up to 100%, highest ever, guiding it to the average of 94% for the financial year. This became possible only because the installed capacities did not increase as much as production did, finally leading to closure of gap between supply and demand. The overall period ACGR is just above the positive mark at 0.10%.

#### **2.1.4. Export**

The export of Indian cement has increased over the years mostly after decontrol, giving the much-required boost to the industry. The demand for cement is a derived demand, for it depends on industrial activity, real estate, and construction activity. Since growth is taking place all over the world in these sectors, Indian export of cement is also increasing. India has an immense potential to tap cement markets of countries in the Middle East and South East Asia due to its strengths of locational advantage, large-scale limestone and coal deposits, adequate cement capacity and production of world-class quality of cement with the latest technology.

Hence, the firms in the industry are capitalizing on the opportunities, provided by the government accompanied by favorable economic conditions. This is evident by the data, which shows negative ACGR of -5.52% in the control period because of highly protected markets. The average export volume in the period was around only 1.7 lakh tonne (L.t.) of cement. As the industry was decontrolled and economy opened up, cement exports started making rapid strides. The period has seen annual compound exponential growth rate of 35.35%. In volume terms, the exports from Indian cement industry increased from 1.43 L.t. in 1989-90 to 58.70 L.t. in 2006-07. The overall ACGR for the period of 37 years however equalized a bit at 13.10%.

#### **2.1.5. Per Capita Consumption**

The per capita consumption of 136 kgs in the year 2006-07, compares poorly with the world average of over 350 kgs and more than 660 kgs in China. Similarly in Japan it is 631 kg/capita while in France it is 447 kg/capita. The process of catching up with international averages emphasizes the tremendous scope for growth in the Indian cement industry in the long term. Also, one of the reasons for strong interest shown by the foreign players in India is due to its lower per capita consumption of cement. The period of 1970-71 to 2006-07 has shown ACGR of 5.15%. When seen under two sub periods of control and decontrol, it displays much higher growth rates of 9.35% in the decontrol period, as compared to 1.11% in the period from 1970-71 to 1988-89. The cement consumption projections by National Council of Applied Economic Research, on a conservative basis, have placed the cement demand of 225

million tonnes by the year 2010-11 (CARE 2007). And if the government goes ahead with infrastructure projects in a big way as planned, the consumption is pegged to be at much higher levels of 291 million tonnes. This will surely increase the current per capita consumption of cement in India.

**Table 2:** Trend in Primary Performance Indicators of the Indian Cement Industry

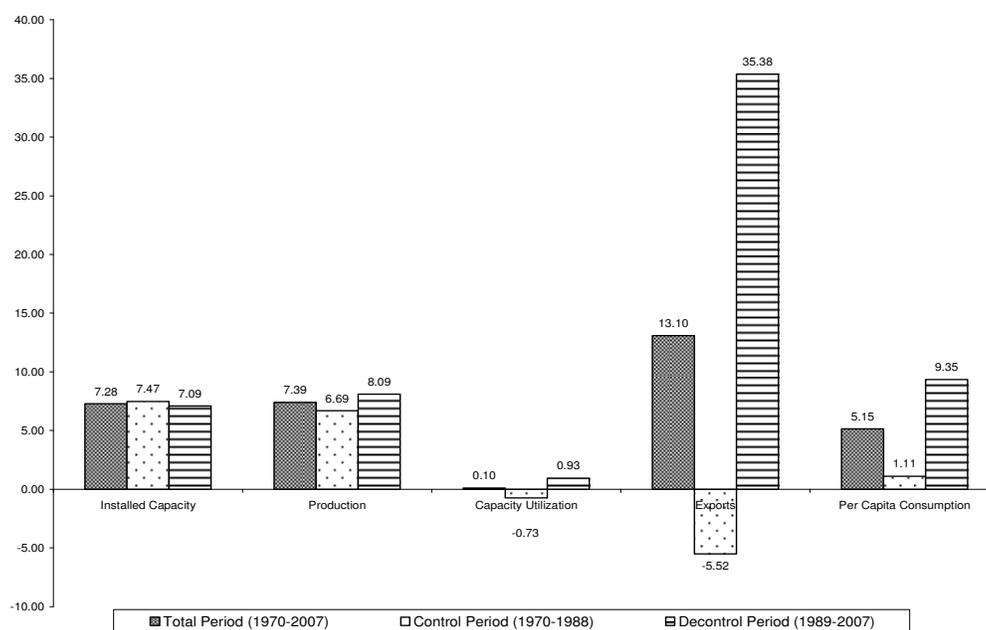
Year	Installed Capacity (Million tonne)	Production (Million tonne)	Capacity Utilization (%)	Export (Lakh tonne)	Per Capita Consumption (Kg.)
1970-71	17.61	14.40	81.77	1.78	26
1971-72	19.56	15.10	77.20	2.66	28
1972-73	19.76	15.60	78.95	2.08	28
1973-74	19.76	14.70	74.39	2.05	26
1974-75	20.06	14.80	73.78	1.32	24
1975-76	21.16	17.30	81.76	3.36	26
1976-77	21.46	18.80	87.60	7.25	29
1977-78	21.91	19.40	88.54	8.27	29
1978-79	22.56	19.42	86.08	0.66	32
1979-80	24.29	17.60	72.46	0.50	30
1980-81	27.92	18.66	66.83	0.74	30
1981-82	29.26	21.10	72.11	0.26	32
1982-83	34.39	23.30	67.75	0.05	32
1983-84	37.04	27.00	72.89	0.06	36
1984-85	42.00	30.13	71.74	0.29	44
1985-86	44.39	33.13	74.63	0.47	39
1986-87	54.40	36.40	66.91	0.48	44
1987-88	57.47	39.37	68.51	0.00	47
1988-89	58.97	44.08	74.75	0.31	51
1989-90	61.55	45.41	73.78	1.43	54
1990-91	63.96	48.76	76.24	2.54	57
1991-92	66.56	53.61	80.54	2.88	63
1992-93	70.09	53.72	76.64	6.65	61
1993-94	76.88	57.96	75.39	19.87	62
1994-95	82.69	62.35	75.40	16.95	65
1995-96	97.25	69.57	71.54	15.70	72
1996-97	105.25	76.22	72.42	19.70	78
1997-98	109.30	83.16	76.08	26.80	82
1998-99	118.97	87.91	73.89	20.60	85
1999-00	119.10	100.45	84.34	19.50	97
2000-01	130.40	97.61	74.85	31.50	99
2001-02	146.13	108.40	74.18	33.80	97
2002-03	151.17	116.35	76.97	34.70	106
2003-04	157.48	123.50	78.42	33.63	110
2004-05	164.69	133.57	81.10	40.71	115
2005-06	160.24	141.81	88.50	60.07	125
2006-07	165.22	155.31	94.00	58.70	136

It can be seen from the above analysis that the performance of primary indicators in the Indian cement industry has been very impressive during the years (Table 2). The annual compound growth rates (ACGR) of the industry has been good

in the overall period, showing better performance in the decontrol period than in the control period, which is evident from Table 3. The only exception to this being installed capacity growth rate, which was slightly higher in the control period leading to oversupply in the industry.

**Table 3: ACGR of Primary Performance Indicators (%)**

Indicators	Total Period (1970-71 to 2006-07)	Control Period (1970-71 to 1987-88)	Decontrol Period (1988-89 to 2006-07)
Installed Capacity	7.28	7.47	7.09
Production	7.39	6.69	8.09
Capacity Utilization	0.10	-0.73	0.93
Exports	13.10	-5.52	35.38
Per Capita Consumption	5.15	1.11	9.35



**Figure 2: Comparison of ACGR (%) in Primary Performance Indicators**

## 2.2. Other Indicators:

Recent trends in some of the other performance indicators of the cement industry are studied in the following section.

### 2.2.1. Technology

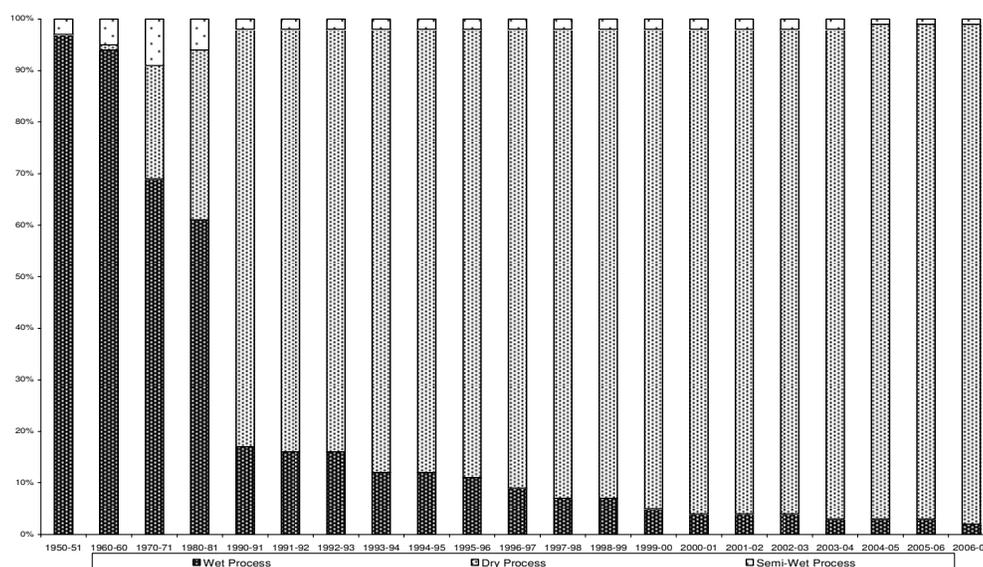
The Indian cement industry has undergone vital changes through technological upgradation and assimilation of latest technology in the pursuit of cost efficiency and

the drive for consolidation. Modernisations at the plants and the improvement of plant processes have also helped reduce manpower requirements (IBEF 2006). Cement production is an energy-intensive process in which a combination of raw materials is chemically altered through intense heat to form a compound with binding properties. These can be ground as a dry mixture or combined with water to form slurry. The addition of water at this stage has important implications for the production process and for the energy demands during production. The three different cement-manufacturing processes in the country are: (a) wet process, (b) semi-wet process, and (c) dry process. The dry and semi-wet processes are more fuel-efficient. The wet process requires 0.28 tonnes of coal and 110 kWh of power to manufacture one tonne of cement, whereas the dry process requires only 0.18 tonnes of coal and 100 kWh of power (IBEF 2006).

The proportion of cement capacity by the wet and semi-wet processes has been decreasing over the past decades. In 1950-51, the major share of cement capacity was from the wet process (97%); the semi-wet process contributed only 3%, with no plants using dry process for production. Since then there is no looking back for the technological upgradations, as today only 2% of capacity uses wet process. The change in technology in Indian cement industry can be seen from figure 3.

**Table 4:** Process-wise Capacity in Indian Cement Industry (%)

Year	Wet Process	Dry Process	Semi-Wet Process	Total
1950-51	97	0	3	100
1960-60	94	1	5	100
1970-71	69	22	9	100
1980-81	61	33	6	100
1990-91	17	81	2	100
1991-92	16	82	2	100
1992-93	16	82	2	100
1993-94	12	86	2	100
1994-95	12	86	2	100
1995-96	11	87	2	100
1996-97	9	89	2	100
1997-98	7	91	2	100
1998-99	7	91	2	100
1999-00	5	93	2	100
2000-01	4	94	2	100
2001-02	4	94	2	100
2002-03	4	94	2	100
2003-04	3	95	2	100
2004-05	3	96	1	100
2005-06	3	96	1	100
2006-07	2	97	1	100



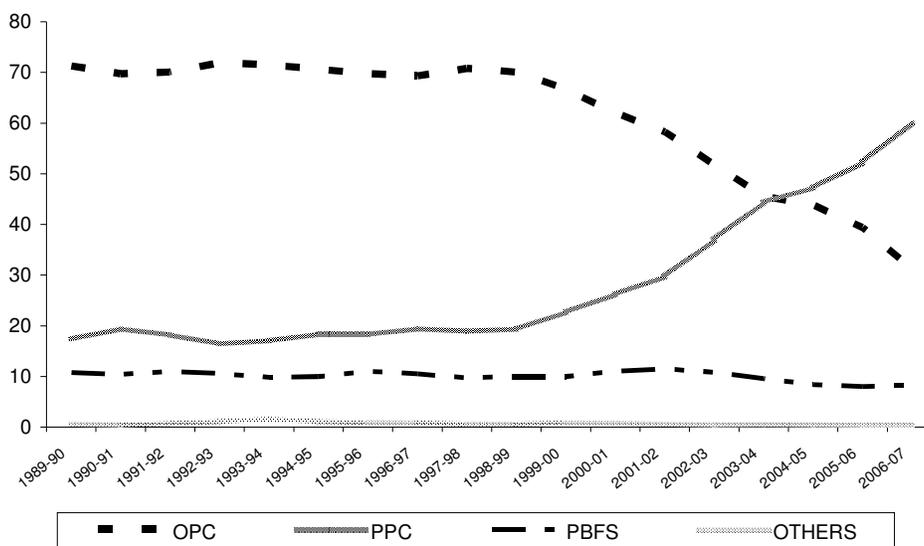
**Figure 3: Process-wise Capacity in Indian Cement Industry**

### 2.2.2. Product Differentiation

India is producing different varieties of cement, based on different compositions according to specific end uses, like Ordinary Portland Cement (OPC), Portland Pozzolana Cement (PPC), Portland Blast Furnace Slag Cement (PBFS), Oil Well Cement, Rapid Hardening Portland Cement, Sulphate Resisting Portland Cement and White Cement etc. The basic difference lies in the percentage of clinker used. These different varieties of cement are produced strictly under BIS specifications and the quality is comparable with the best in the world. As seen from figure 4 below, the production of Ordinary Portland Cement has decreased since deregulation, it being 71.28% in 1989-90 slipping to 31.21% now. Percentage of production of Portland Pozzolana Cement has steadily increased from 17.37% in 1989-90 to 60.12% in the year 2006-07. This is a favourable change in the product-mix of Indian cement industry as PPC in more specialized type of cement.

In an environment of growing competition witnessed in the post decontrol era, one of the major developments has been the introduction of higher grades of cement. Grade is the 28 days compressive strength of Ordinary Portland cement, when tested as per Indian Standards under standard conditions. Depending upon the strength

requirement, OPC is thus classified as OPC-33 grade, OPC-43 grade and OPC-53 grade. However, realization is growing fast amongst the consumers at large, that the properties of durability are of greater importance than strength.



**Figure 4:** Trend in Variety-wise Cement Production (%)

### 2.2.3. Concentration

Concentration in the Indian cement industry can be seen through following two indicators.

#### 2.2.3.1. Regional Concentration

Cement, being a bulk commodity, is freight intensive and transporting cement over long distances can prove to be uneconomical. This has resulted in cement being largely a regional play with the industry divided into five main regions, viz., North, South, West, East and the Central region. Until 1999-2000, Indian was divided in only four regions; centre came up only after that. Punjab, Rajasthan, Haryana and Himachal Pradesh fall in northern region whereas Bihar, Jharkhand, Orissa, West Bengal and Chattisgarh are in eastern region. The west comprises of Gujrat and Maharashtra and the central region has Uttar Pradesh and MP, thus leaving AP, Tamil Nadu, Kerala and Karnataka for southern region.

In terms of capacity historically, the southern region has always dominated the industry and is excess in capacity owing to the availability of limestone, but the

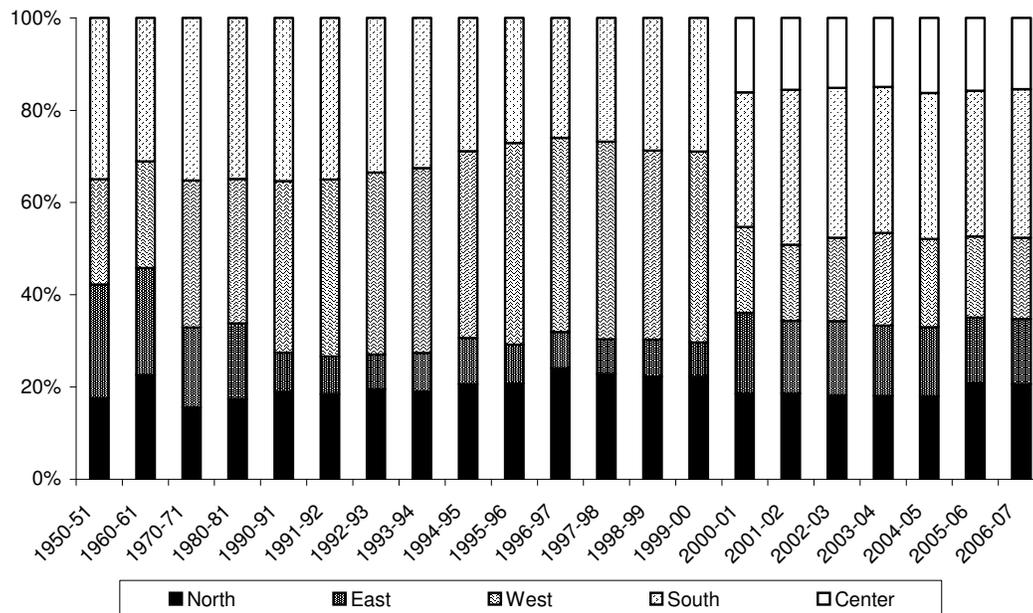
western and northern regions are the most lucrative markets. East has most of the consumption of cement as of now due to growing infrastructure. When we look at the evolution of the industry, it can be seen that distribution of capacities of cement in India has now been more balanced thus reducing the concentration in the southern region of the country.

In 1950-51, the maximum capacity was in Southern region i.e. 34.91% while North had the least of 17.59%. This scenario remained the same in the following decade and in 1970-71, when south installed 35.24% of capacities whereas North deteriorated with 15.60% of capacities. Situation was the same till 1980s. It was only in 1990s when West grew up to first position in terms of capacity. But as the fifth geographical division came up, with MP moving to center with a major chunk of capacity, the concentration has reduced. Also earlier capacities were concentrated around limestone deposits only but market access has become very important determinant of location of cement plants. In 2006-07, South again dominated the capacities with 32.22%, which are actually excess, East, West and Centre has more or less equal capacities of 14%, 18% and 15% respectively whereas North is second highest at 21%.

**Table 5: Region wise Capacity of Cement in India**

(Percent)

Year	North	East	West	South	Center	Total
1950-51	17.59	24.64	22.86	34.91	-	100.00
1960-61	22.63	23.19	23.08	31.10	-	100.00
1970-71	15.60	17.33	31.83	35.24	-	100.00
1980-81	17.40	16.42	31.31	34.87	-	100.00
1990-91	18.96	8.45	37.22	35.36	-	100.00
1991-92	18.55	8.13	38.28	35.03	-	100.00
1992-93	19.48	7.54	39.51	33.47	-	100.00
1993-94	19.02	8.34	40.15	32.49	-	100.00
1994-95	20.64	9.99	40.52	28.85	-	100.00
1995-96	20.80	8.36	43.74	27.09	-	100.00
1996-97	24.06	7.88	42.04	26.03	-	100.00
1997-98	22.83	7.56	42.84	26.77	-	100.00
1998-99	22.28	8.01	40.95	28.76	-	100.00
1999-00	22.22	7.44	41.41	28.94	-	100.00
2000-01	18.58	17.54	18.59	29.19	16.11	100.00
2001-02	18.68	15.63	16.55	33.58	15.55	100.00
2002-03	18.20	16.06	18.08	32.48	15.17	100.00
2003-04	18.10	15.28	20.00	31.70	14.93	100.00
2004-05	18.00	14.95	19.13	31.64	16.28	100.00
2005-06	20.92	14.14	17.58	31.65	15.71	100.00
2006-07	20.62	14.18	17.54	32.22	15.44	100.00



**Figure 5: Regional Concentration of Cement Capacities (%)**

#### 2.2.3.2. Market Concentration and Increased Competition

Though the industry saw consolidation by domestic players starting in the mid-1990s, it was only in the late 1990s that foreign players entered the market. The structure of the industry can be viewed as fragmented, although the concentration at the top has increased, as the top 5 players control around 60.28% of market share, which was 55% in 1989-90, whereas the other 39.72% of market share is distributed among 50 minor players. The fragmented structure is a result of the low entry barriers in the post decontrol period and the ready availability of technology.

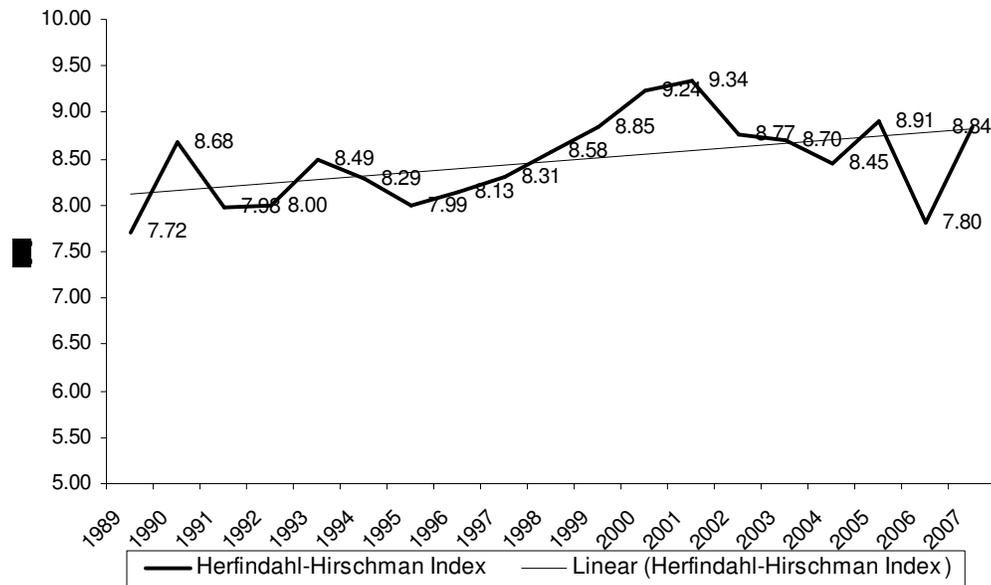
The extent of concentration in the Indian cement industry has increased over the years. This concentration is mainly because of the focus of the larger and the more efficient units to consolidate their operations by restructuring their business and taking over relatively weaker units. Also the relatively smaller and weaker units are finding it difficult to resist the cyclical pressure of the cement industry. Some of the key benefits (ICRA 2006) accruing to the acquiring companies from these acquisition deals include-

- Economies of scale resulting from the larger size of operations
- Savings in the time and cost required setting up a new unit
- Access to newer markets
- Access to special facilities / features of the acquired company
- Benefits of tax shelter

The cement industry is witnessing a number of multinationals entering the market and mergers and acquisitions in domestic market itself, bringing smaller players under the umbrella of larger companies, and larger companies coming under the umbrella of global players.

The booming demand for cement, both in India and abroad, has attracted global majors to India. In 2005-06, four of the top-5 cement companies in the world entered India through mergers, acquisitions, joint ventures or greenfield projects. These include France's Lafarge, Holcim from Switzerland, Italy's Italcementi and Germany's Heidelberg Cements. The consolidation witnessed in the industry in recent times has resulted in two crucial domestic deals. First being the de-merger of L&T's cement (renamed as Ultratech Cement Ltd.) division and its acquisition by Grasim. This has led to the creation of cement giant, making the Ultratech- Grasim combine the market leader in the country in terms of market share, particularly in the South. The other consolidation effort was seen when Gujarat Ambuja acquired 14.4% stake in ACC in 2000 (India Infoline 2003). Following this Holcim took a big stake in ACC in the year 2005 and has recently announced an acquisition of 14.8% in Gujarat Ambuja Cement Ltd., now Ambuja Cements Ltd. Thus, the top two groups in the industry, Aditya Birla Group (Grasim and Ultratech Cements Ltd. combine) and Holcim Group (Ambuja Cements Ltd. - ACC Ltd. combine) now control more than 45 % of total capacity in the country.

The Herfindahl-Hirschman Index (Burange 2003) is calculated to view the industry concentration ratios, which shows steady increase. The index (converted into percentage) has increased particularly in late the 1990s, reaching highest in 2000-01, although it decreased thereafter. The value has again started to increase from the previous year 2005-06, it being 7.80% then and 8.84% in 2006-07.



**Figure 6:** Herfindahl-Hirschman Index for Industry Concentration

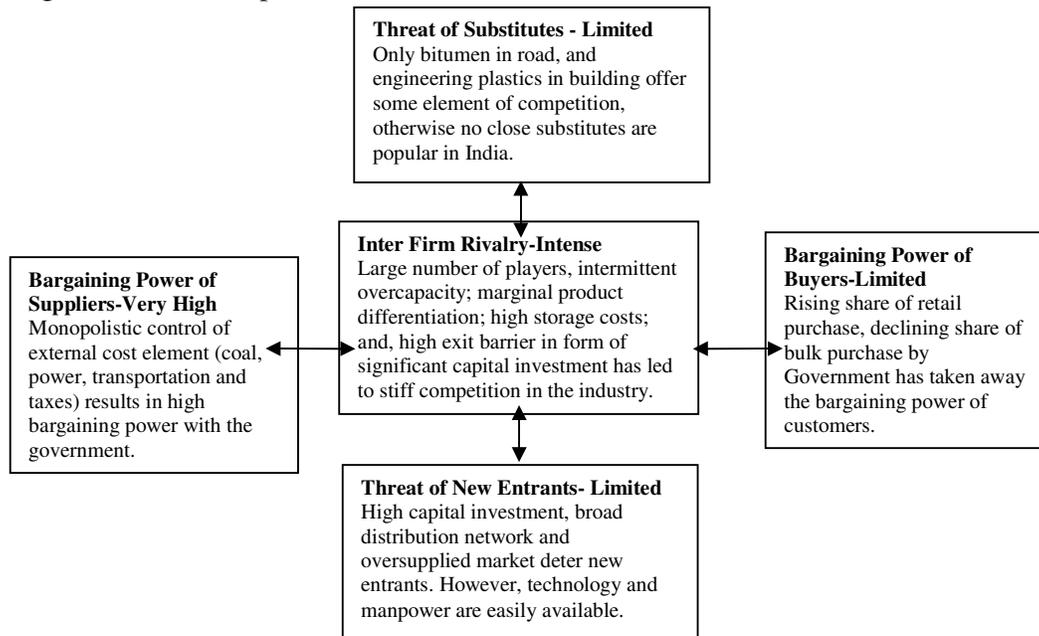
All this indicates that the consolidation of capacities through mergers and acquisitions is going to be the name of the game for the players to grow and consolidate their share since green field projects involve a considerable gestation period. Further, the fragmented nature of the industry, offers ample opportunity for quickly acquiring the capacities and size (CARE 2007). This trend is also in line with the global trend, where only two or three cement producers dominate the entire market in their respective countries.

It is known that the status of the industry is only the sum total of the performance of the firms within it. Hence it becomes relevant here to study the performance of firms in the Indian cement industry, with reference to increased competitiveness in domestic market among firms, especially after decontrol of the industry and resultant influx of multinational firms. The following section will reflect the current scenario of competition in the Indian cement industry.

### **3. COMPETITIVENESS OF FIRMS IN THE INDUSTRY:**

The structure and competitive scenario of the Indian cement industry can be described concisely with the help of Porters' notable Five-Forces Model (1980) that

determine the attractiveness of the industry and the way in which individual firms might choose to compete.



### 3.1. Methodology:

The technique that is used for evaluating competitiveness of firms in the Indian cement industry is construction of composite competitiveness index. A composite indicator is the mathematical combination of individual indicators that represent different dimensions of a concept whose description is the objective of the analysis (Saisana and Tarantola 2002). We attempt to aggregate various dimensions of the problem of firm level competitiveness so that it can well be measured. There are various methodological choices confronted in the problem of building the index, the specific techniques used for our study has been discussed below.

It is appropriate to firstly define competitiveness of firms in short as one of the immediate problems in analyzing competitiveness is that despite widespread acceptance of its importance for economic performance and growth, no consensus exists on its definition and measurement because of its several interpretations. Main issues regarding the concept of competitiveness are pertaining to the level of aggregation (firm, industry, nation and regions) and the number of dimensions it measures. We are primarily concerned with the measurement of multidimensional concept of competitiveness at the firm level in the Indian cement industry.

One of the most interesting attempts to capture more than one dimension of firm competitiveness was made by Buckley et al. (1988). According to him, “a firm is competitive if it can produce products and services of superior quality and at lower costs than its domestic and international competitors. Competitiveness is synonymous with a firm's long-run profit performance and its ability to compensate its employees and provide superior returns to its owners”.

Gelei (2003) has used the definition of firm competitiveness as ‘the basic capability of perceiving changes in both the external and internal environment and the capability of adapting to these changes in a way that the profit flow generated guarantees the long term operation of the firm’. As to him, firm competitiveness is basically a function of two factors. First, it is determined by the extent a company can identify those value dimensions that are important for their customers. These are the main features of the firm’s complex product and service package a customer expects. The second factor of firm competitiveness is the sum of resources and capabilities that make a firm capable to create and deliver the identified important value dimensions for the customer. Prahalad and Hamel (1990) call these core competences.

A *White Paper* on competitiveness by the UK Government (Department of Trade and Industry 1994) offers a multi-notion definition at the company level, which says, ‘for a firm, competitiveness is the ability to produce the right goods and services of the right quality, at the right price, at the right time. It means meeting customers’ needs more efficiently and more effectively than other firms’.

Another significant discussion on the concept of competitiveness of firms was published by ADB (2003). It states that competitiveness can be defined as a firm’s ability to survive under competition and being competitive implies succeeding in an environment where firms try to stay ahead of each other by reducing prices, by increasing the quality of their current products and services, and by creating new ones. A firm’s competitiveness can thus be examined as a function of factors such as (i) its own resources (ii) its market power; (iii) its behavior toward rivals and other economic agents; (iv) its capability to adapt to changing circumstances; (v) its capability to create new markets; and (vi) the institutional environment, largely

provided by the government, including physical infrastructure and the quality of government policies.

### **3.2. Data- Coverage and Adjustments:**

The variables that constitute the competitiveness index for Indian cement industry have been identified on the basis of factors related to competitiveness at the firm level, considering the specific issues peculiar to the industry. Total number of sub-indicators used for the competitiveness index are 63 out of which 38 (60.3%) are taken from *PROWESS* database of Centre for Monitoring Indian Economy (CMIE) and 25 (39.7%) from other data sources. Other data sources include a questionnaire survey, which was carried out for all sample firms. Some of the other sources used for preparing the database are company websites, Cement Manufacturers' Association (CMA) website and other publications.

One of the sub-indicators used for technological index, is environmental indicator, which includes Total Emissions, Industrial Waste Usage in Production, Suspended Particulate Material (SPM), Noise Pollution, Certification to Plants, and Environmental Management Expenditure. Due to lack of response from the sample firms, we used Centre for Science and Environment (CSE) scores of Green Rating Project (CSE 2005), which include similar indicators.

The sub-indicators, which are used to construct the competitiveness index of the firm, are listed in Table 6. All of these sub-indicators are then grouped into ten main indicators that clearly describe its components.

### **3.3. Sample Selection:**

The sample of firms has been chosen on the basis of market share in sales for the year 2006-07 (Table 7). Efforts have been made to include a representative sample, which covers at least 90% of the overall market share of the industry. Also all firms that have greater than 1% of the shares are included, thus making total count of sample firms to 17.

**Table 6:** Description of the Sub-indicators in the Competitiveness Index  
for Indian Cement Industry

<b>Indicators</b>	<b>Sub- indicators</b>
1. Productive Performance	<ul style="list-style-type: none"> <li>○ Capacity Utilization</li> <li>○ Labour Productivity</li> </ul>
2. Financial Performance	Liquidity Ratio: <ul style="list-style-type: none"> <li>○ Current Ratio</li> <li>○ Quick Ratio</li> </ul> Leverage Ratio: <ul style="list-style-type: none"> <li>○ Debt-Equity Ratio</li> <li>○ Interest Coverage Ratio</li> </ul> Efficiency Ratio: <ul style="list-style-type: none"> <li>○ Inventory Management</li> <li>○ Debtors Turnover Ratio</li> </ul> Profitability Ratio: <ul style="list-style-type: none"> <li>○ Net Margin Ratio</li> <li>○ Return on Assets Ratio</li> <li>○ Return on Net Worth (ROE)</li> <li>○ Return on Capital Employed (ROCE)</li> </ul> Other Ratios: <ul style="list-style-type: none"> <li>○ Net Working Capital Cycle</li> <li>○ Solvency Ratio</li> <li>○ Asset Turnover Ratio</li> </ul>
3. Cost Effectiveness	<ul style="list-style-type: none"> <li>○ Cost As % of Gross Sales</li> </ul> Other Cost Indicators: <ul style="list-style-type: none"> <li>○ Raw Materials, Stores etc.</li> <li>○ Financial Charges</li> </ul>
4. Sales and Marketing Strategy	<ul style="list-style-type: none"> <li>○ Market Share</li> <li>○ Department for Brand Management</li> <li>○ Number of Dealers/ Stockists</li> <li>○ Expenditure on Marketing</li> <li>○ Expenditure on Advertising</li> </ul>
5. Stock Market Performance	<ul style="list-style-type: none"> <li>○ Earnings Per Share</li> <li>○ Price- Earning Ratio</li> <li>○ Book Value Per Share</li> </ul>
6. Consumer Satisfaction	<ul style="list-style-type: none"> <li>○ Customer Satisfaction Studies</li> <li>○ Techniques for Measuring Customer Satisfaction</li> <li>○ Award for Customer Satisfaction</li> </ul>
7. Technology and Environmental Indicators	Technology Acquisition: <ul style="list-style-type: none"> <li>○ Technology Strategy: Import or In-House Development</li> <li>○ Foreign Exchange Spending on Capital Goods</li> <li>○ Royalty know how expenses</li> <li>○ R &amp; D Expenditure</li> </ul> Technology Management: <ul style="list-style-type: none"> <li>○ Number of Production Plants</li> <li>○ Product Differentiation (brands)</li> <li>○ Grades of Ordinary Portland Cement Produced</li> <li>○ Power and Fuel Expenses</li> <li>○ Packaging Expenses</li> <li>○ Internal Audit of the Quality System</li> <li>○ Logistics- Distribution Cost as % of Total Cost</li> </ul> Environmental Indicators: <ul style="list-style-type: none"> <li>○ Total Emissions</li> <li>○ Industrial Waste Usage in Production</li> </ul>

	<ul style="list-style-type: none"> <li>○ Suspended Particulate Material (SPM)</li> <li>○ Noise Pollution</li> <li>○ Certification to Plants</li> <li>○ Environmental Management Expenditure</li> </ul>
8. Human Resource Development and Social Indicators	<ul style="list-style-type: none"> <li>○ Employment Generation</li> <li>○ Employee Cost as % of Total Cost</li> <li>○ Performance Incentives to Employees</li> <li>○ Skill Enhancing Training</li> <li>○ Certification to Plants (Health And Safety)</li> <li>○ Loss Due to Labor Unrest</li> </ul>
9. Foreign Trade Measure	<ul style="list-style-type: none"> <li>○ Net Foreign Exchange Earned</li> <li>○ Exports as % of Gross Sales</li> </ul>
10. Growth Variables and Potential	<p>Growth Variables (over previous year):</p> <ul style="list-style-type: none"> <li>○ Total Assets</li> <li>○ PAT (NNRT)</li> <li>○ Net Sales</li> <li>○ Total Exports</li> </ul> <p>Future Plans:</p> <ul style="list-style-type: none"> <li>○ Firm's Investment Plans over the Next 2 Years</li> <li>○ Plans to Launch any New Brands in Next 2 Years</li> </ul> <p>Contingency Planning:</p> <ul style="list-style-type: none"> <li>○ Insurance Premium Expenses</li> <li>○ Any Department for Disaster Management</li> <li>○ Maintenance- Plant and Machinery Repairs Expenditure</li> </ul>

**Table 7:** Market Share in Sales of the Sample Firms in Cement Industry in 2006-07

Firm	Market Share (%)
1. Grasim Industries Ltd.	18.38
2. Ambuja Cements Ltd.	13.34
3. A C C Ltd.	12.13
4. Ultratech Cement Ltd.	10.49
5. Century Textiles & Inds. Ltd.	6.89
6. India Cements Ltd.	4.82
7. Birla Corporation Ltd.	3.47
8. Madras Cements Ltd.	3.37
9. Shree Cement Ltd.	3.00
10. J K Cement Ltd.	2.64
11. Dalmia Cement (Bharat) Ltd.	2.10
12. J K Lakshmi Cement Ltd.	1.81
13. Sanghi Industries Ltd.	1.75
14. O C L India Ltd.	1.73
15. Chettinad Cement Corpn. Ltd.	1.65
16. Binani Cement Ltd.	1.45
17. Prism Cement Ltd.	1.19
<b>Total</b>	<b>90.21</b>

Source: Prowess Database

### 3.4. Building of the Index:

The technique used for normalizing and aggregation of indicators for the cement industry competitiveness index of firms, is based on the method used by Burange and Yamini (2008). Identically, the Budget Allocation Method is used to

assign weights to all indicators. This method is a participatory method in which experts are given a ‘budget’ of  $N$  points, to be distributed over a number of indicators, ‘paying’ more for those indicators whose importance they want to stress (Saisana 2005). As experts in the field participate, weights necessarily reflect the viewpoint of the industry in question, as a whole.

In the present study, the ten broad indicators were listed in the questionnaires itself. The objective was to take opinions of maximum number of experts from each of the sample firms, particularly those with more experience in the industry. This reduced the subjectivity in the index as officials already working in the industry have clear insight into the problem of competitiveness. The weights were then averaged out across the sample firms, which showed the following (Table 8) results.

**Table 8:** Weights of the Indicators

<b>Indicators</b>	<b>Average Weights</b>
1. Productive Performance	10.43
2. Financial Performance	10.86
3. Cost Effectiveness	11.29
4. Sales And Marketing Strategy	12.50
5. Stock Market Performance	06.79
6. Consumer Satisfaction	10.78
7. Technological and Environmental Indicators	11.14
8. Human Resource Development	09.86
9. Foreign Trade	04.71
10. Growth Performance and Potential	11.64
<b>Total</b>	<b>100.00</b>

After weight allocation to each of the ten indicator indices, these scores are aggregated linearly into a composite score. Lastly, the ten indicators are grouped in two groups namely Financial and Non-financial Indicators and constructed separate for both the indices for the purpose of analysis. Also industry average scores are calculated to measure the average competitiveness in the industry.

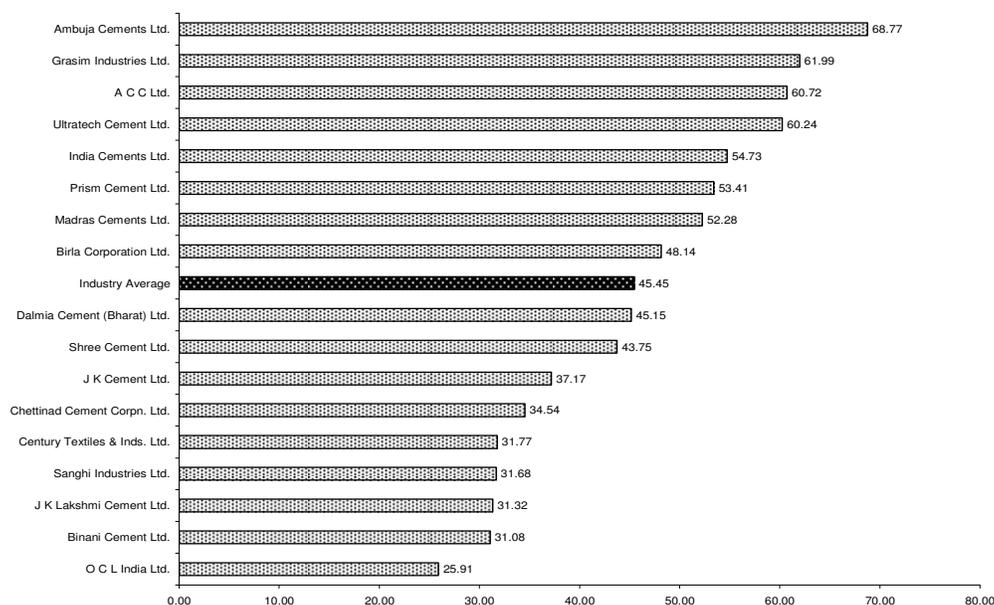
### 3.5. Results and Analysis:

Industry average score of competitiveness index has been calculated at 45.45, which is used to analyse the competitive performance of firms above and below it. It is hence used to benchmark the firms’ competitive standings in the industry. Eight firms from the sample of seventeen firms i.e. 47% of the total sample size, show performance above industry average and remaining nine (53%) are below this

average. The competitive scenario thus reflected here suggests that the difference between top ranking players and lower ranking players is immense which has pulled down the industry average score for competitiveness of firms. The main firms above industry average score out of the eight are Grasim Industries Ltd., ACC Ltd., Ambuja Cements Ltd., and Ultratech Cement Ltd. Others in this group are India Cements Ltd., Prism Cement Ltd., Madras Cements Ltd. and Birla Corporation Ltd. the remaining firms in the sample are below this average.

**Table 9:** Overall Rankings and Scores of Cement Firms

Firm	Rank	Score
Ambuja Cements Ltd.	1	68.77
Grasim Industries Ltd.	2	61.99
A C C Ltd.	3	60.72
Ultratech Cement Ltd.	4	60.24
India Cements Ltd.	5	54.73
Prism Cement Ltd.	6	53.41
Madras Cements Ltd.	7	52.28
Birla Corporation Ltd.	8	48.14
<b>Industry Average</b>		<b>45.45</b>
Dalmia Cement (Bharat) Ltd.	9	45.15
Shree Cement Ltd.	10	43.75
J K Cement Ltd.	11	37.17
Chettinad Cement Corpn. Ltd.	12	34.54
Century Textiles & Inds. Ltd.	13	31.77
Sanghi Industries Ltd.	14	31.68
J K Lakshmi Cement Ltd.	15	31.32
Binani Cement Ltd.	16	31.08
O C L India Ltd.	17	25.91



**Figure 7:** Scores of Cement Firms in Competitiveness Index

### 3.5.1. Competitiveness of the Firm:

In the overall competitiveness rankings, Ambuja Cements Ltd. comes first with 68.77 score. This result is because of its outstanding performance in all the indicators, except in stock market performance. The firm has scored particularly well in productive performance, cost effectiveness and foreign trade with first ranking in productive performance and third ranking in the other two. Ambuja Cements Ltd. has maximum score in both sub-indicators of productive performance i.e. capacity utilization (more than 100%) and labour productivity. Also it has best foreign exchange earnings in its pool, along with good financial ratios, especially profitability ratios. Sales and marketing strategy, consumer satisfaction and growth potential also seem to be its strengths. In all the remaining indices, the firm has above average performance, thus justifying its top most ranking in the competitiveness rankings.

Grasim industries has secured second ranking in the overall rankings with a score of 61.99 which is much lower than the first ranking score of 68.77. This is due to the fact that it scored below average scores in four of the indicator indices. Although it may be noted in Table 10, that in the indicators in which it marked above average scores, the firm has done exceptionally well thus pulling its position to number two. The firm has got maximum score in sales and marketing strategy and consumer satisfaction, whereas second in stock market performance, technology and environmental indicators and human resource development. Its weakness lies in the productive performance, cost effectiveness and foreign trade measure.

The third position is taken by ACC Ltd. with 60.72 score. This result is largely on account of its superior performance in technological and environmental indicators as well as in growth variables and potential. In both the indicator index, it has got first rankings. Technological superiority comes from maximum research and development expenditure and broad production base with good number of plants, whereas it shows great growth potential with firms' expansion plans and good maintenance expenditure. ACC Ltd. has also performed well in indicators of cost effectiveness, sales and marketing strategy, consumer satisfaction and human resource development. Although, it's overall ranking slipped due to poor productive performance with only 76% of capacity utilization and foreign trade indicator with negative forex earnings

**Table 10: Scores and Ranks of the Firms for Indicators**

Firm	Productive Performance		Financial Performance		Cost Effectiveness		Sales and Marketing Strategy		Stock Market Performance		Consumer Satisfaction		Technology and Environmental Indicators		Human Resource Development		Foreign Trade Measure		Growth Variable and Potential	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
A C C Ltd.	1.93	15	5.89	8	8.75	3	8.56	3	1.70	5	9.59	3	7.38	1	8.26	3	1.61	12	7.06	1
Ambuja Cements Ltd.	10.43	1	8.25	3	9.46	2	8.48	4	0.63	14	9.59	4	5.55	5	7.32	6	2.81	2	6.28	4
Binani Cement Ltd.	6.31	3	2.40	17	7.52	9	2.98	12	0.63	13	0.00	15	3.39	15	3.35	15	1.55	14	2.96	13
Birla Corporation Ltd.	1.22	17	8.46	2	8.49	5	4.86	9	0.74	11	4.79	8	4.54	12	8.98	1	1.83	5	4.24	10
Century Textiles & Inds. Ltd.	2.38	14	3.77	16	4.82	15	4.10	11	2.80	3	0.00	16	5.43	7	4.65	11	1.83	6	1.99	17
Chettinad Cement Corp Ltd	7.83	2	5.23	10	6.05	14	1.12	16	1.01	9	1.20	11	4.20	13	3.60	14	1.69	10	2.61	16
Dalmia Cement (Bharat) Ltd.	4.72	7	4.26	14	3.90	16	4.39	10	1.27	7	5.99	6	5.16	8	7.08	7	1.40	16	7.00	2
Grasim Industries Ltd.	1.45	16	6.50	5	6.12	13	10.62	1	4.71	2	10.79	1	7.15	2	8.91	2	0.18	17	5.56	5
India Cements Ltd.	4.23	9	4.44	11	7.90	8	7.85	5	0.92	10	9.59	5	5.55	6	7.42	4	1.76	7	5.09	7
J K Cement Ltd.	2.51	13	5.28	9	6.96	10	5.81	8	0.57	15	2.40	9	4.63	11	3.67	13	1.73	8	3.62	11
J K Lakshmi Cement Ltd.	3.33	12	6.71	4	7.99	6	1.47	14	0.52	16	1.20	12	2.95	16	2.18	17	1.69	9	3.29	12
Madras Cements Ltd.	4.22	10	5.99	7	8.58	4	6.18	7	5.04	1	2.40	10	5.68	4	7.33	5	1.50	15	5.36	6
O C L India Ltd.	4.13	11	4.03	15	3.04	17	1.44	15	1.08	8	0.00	17	3.74	14	3.70	12	1.86	4	2.89	14
Prism Cement Ltd.	5.90	5	8.59	1	11.00	1	1.04	17	0.30	17	5.99	7	5.72	3	6.75	8	1.68	11	6.45	3
Sanghi Industries Ltd.	4.49	8	4.29	13	6.32	12	1.90	13	0.65	12	1.20	13	1.95	17	3.34	16	4.68	1	2.85	15
Shree Cement Ltd.	5.66	6	4.42	12	6.92	11	6.45	6	2.08	4	1.20	14	4.92	10	5.53	9	1.59	13	4.98	8
Ultratech Cement Ltd.	5.93	4	6.30	6	7.93	7	10.03	2	1.61	6	10.79	2	4.96	9	5.26	10	2.62	3	4.80	9
<b>Industry Average</b>	<b>4.51</b>		<b>5.58</b>		<b>7.16</b>		<b>5.13</b>		<b>1.54</b>		<b>4.51</b>		<b>4.88</b>		<b>5.73</b>		<b>1.88</b>		<b>4.53</b>	

Note: Shaded scores of firms indicate above industry average performance in that particular indicator.

coupled with meager exports. The fourth position, very close to ACC Ltd., is held by another cement major, Ultratech Cement Ltd. which has 60.24 score. This firm has performed well in sales and marketing strategy where its dealer's base is vast with strong advertising and foreign trade measure with a decent net forex earned. The only indicator in which it has performed below average is human resource development.

Ambuja Cements appears to be comfortable with much difference of overall score with the second ranking firm. But if Grasim and Ultratech are looked upon jointly, under the Aditya Birla Group, Ambuja's first position will surely be in danger. But large stakes of Holcim, the second largest cement producer in the world, in Ambuja and ACC, has also made sure that they compete well with the Aditya Birla Group. With such a scenario in the market, stiff competition lies merely between the Aditya Birla Group and Holcim at the top, which when combined also control around 54% market share of the industry.

India Cements Ltd. is at the fifth position but the difference of score with Ultratech Cement Ltd. is much where it has got only 54.73 points. This again indicates the true market situation of the Indian cement industry where the above mentioned four companies are dominant, creating an oligopolistic situation. However, considering the fact that India Cements Ltd. mainly caters to southern market, its position is good enough. The company has performed well in human resource development as well as sales and marketing strategy. Prism Cement Ltd. and Madras Cements Ltd. who are very close with India Cements Ltd hold sixth and seventh positions. It is noteworthy that Prism Cement Ltd. has got such a low position in spite of it being at the top in financial performance and cost effectiveness thus indicating high profitability. But it's especially bad performance in sales and marketing strategy, stock market performance and foreign trade measure has pulled down its overall ranking. Madras Cements Ltd. has proved its superiority in stock market with best earning per shares (EPS). However, it fumbled in foreign trade and productive performance. The last company above the industry average is mid-cap Birla Corporation Ltd. with 48.14 score. It is best in human resource and second in financial performance but last in productive performance with low levels of capacity utilization as well as labour productivity.

All the above-discussed firms are above the industry average in terms of their competitive performance in various indicators and hence showing good competitive behavior. The remaining eight firms, which are below the industry average, are discussed below. The ninth, tenth, eleventh and twelfth positions are taken by Dalmia Cement (Bharat) Ltd. (45.15), Shree Cement Ltd. (43.75), J K Cement Ltd. (37.17) and Chettinad Cement Corpn. Ltd (34.54). Dalmia Cement (Bharat) Ltd. has weakness in cost effectiveness but is very strong in growth prospects with major expansion plans for future. Shree Cement Ltd. has good stock market performance where it stands 4<sup>th</sup>. J K Cement Ltd. has above industry average performance in only sales and marketing. Same is the case with Chettinad Cement Corpn. Ltd. where it has attained second ranking only in productive performance, all other indicators show below average performance.

There is not much difference in the competitive score between 13<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup> and 16<sup>th</sup> ranking firms i.e. Century Textiles & Inds. Ltd., Sanghi Industries Ltd., J K Lakshmi Cement Ltd. and Binani Cement Ltd. The scores of all these firms are around 31. Sanghi Industries Ltd. has scored first rank in foreign trade measure with maximum exports. OCL India Ltd. has got minimum of 25.91 score as it has performed below average in all the ten indicators.

### **3.5.2. Financial and Non-Financial Indices:**

Competitiveness is related to the ability of firms to perform better than rivals, where performance is dependent on both financial and non-financial conditions. For the purpose of analysis, competitiveness index has been divided into financial index and non-financial index. The objective is to ascertain which of the two indices has greater significance on the overall competitiveness index of a firm.

With this objective, financial indicators such as different financial ratios, cost effectiveness, stock market performance and foreign trade indicators are grouped under financial index and other indicators such as productive performance, sales and marketing strategy, consumer satisfaction, technological issues, human resource and growth variables are grouped under non-financial indicators. The former has 33.64% of the total weights whereas the later gets remaining 66.36%. Importance to non-

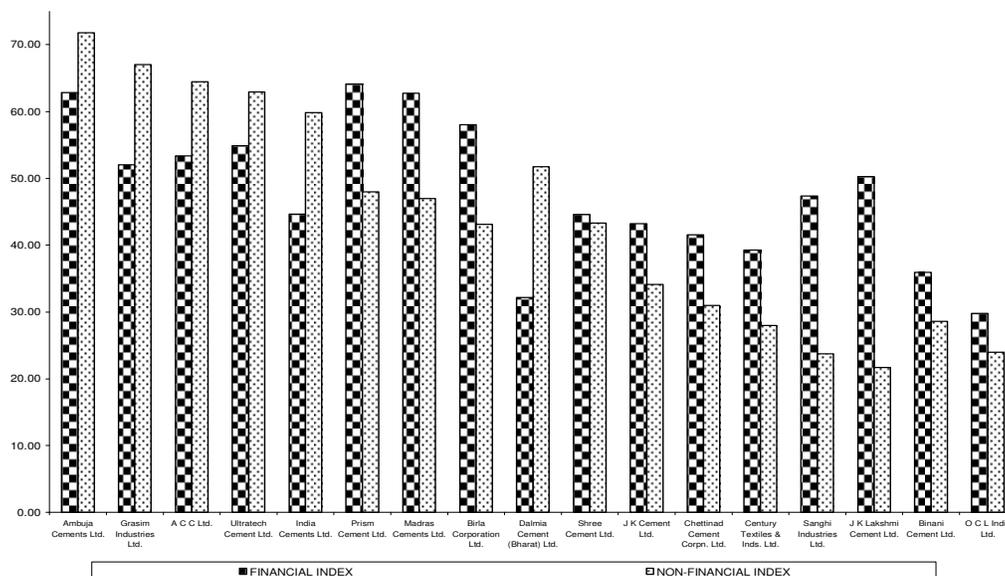
financial factors is given visibly more by the industry experts in the survey of sample firms (Table 8). Using the weighted average of the indicator indices, financial and non-financial indices are constructed.

There is much variation viewed in the financial and non-financial rankings of firms in the Indian cement industry as reflected from Table 11. This is more visible in the financial index of all the firms. Prism Cement Ltd. stands 1<sup>st</sup> in financial index but ranks 7<sup>th</sup> in the non-financial index. J K Lakshmi Cement Ltd., Madras Cements Ltd., Birla Corporation Ltd. and Sanghi Industries Ltd. are the only other firms who have performed better in financial index.

**Table 11:** Comparison of Rankings in Financial and Non-financial Indicators

Firm	Overall Index		Financial Index		Non-financial Index	
	Score	Rank	Score	Rank	Score	Rank
Ambuja Cements Ltd.	68.77	1	62.82	2	71.78	1
Grasim Industries Ltd.	61.99	2	52.03	7	67.03	2
A C C Ltd.	60.72	3	53.35	6	64.46	3
Ultratech Cement Ltd.	60.24	4	54.90	5	62.95	4
India Cements Ltd.	54.73	5	44.65	10	59.84	5
Prism Cement Ltd.	53.41	6	64.11	1	47.99	7
Madras Cements Ltd.	52.28	7	62.77	3	46.96	8
Birla Corporation Ltd.	48.14	8	58.01	4	43.14	10
Dalmia Cement (Bharat) Ltd.	45.15	9	32.16	16	51.74	6
Shree Cement Ltd.	43.75	10	44.60	11	43.32	9
J K Cement Ltd.	37.17	11	43.21	12	34.12	11
Chettinad Cement Corpn. Ltd.	34.54	12	41.56	13	30.98	12
Century Textiles & Inds. Ltd.	31.77	13	39.29	14	27.96	14
Sanghi Industries Ltd.	31.68	14	47.37	9	23.72	16
J K Lakshmi Cement Ltd.	31.32	15	50.28	8	21.71	17
Binani Cement Ltd.	31.08	16	35.95	15	28.62	13
O C L India Ltd.	25.91	17	29.76	17	23.95	15

The main firms that have better performance in non-financials are Grasim Industries Ltd., Ambuja Cements Ltd., A C C Ltd., Ultratech Cement Ltd., India Cements Ltd. and Dalmia Cement (Bharat) Ltd. (figure 8). Grasim Industries Ltd. has as low as 7<sup>th</sup> rank in financials reflecting its major weakness in the same. India Cements although has low ranking in financials, it has maintained 5<sup>th</sup> ranking in both overall and non-financial indicators. Dalmia Cement too performs particularly poorly in financials. All the other firms in the sample have more or less similar rankings in all the three indices.



**Figure 8:** Comparison Financial and Non-financial Indicators

### 3.5.3. Regional Rankings:

Cement being a regional play; we study the rankings of the firms depending upon their areas of operation. It becomes proper to view the overall scores and rankings in the context of five regions of India; North, East, South, West and Center. It can be ascertained from Table 12 that two of the regions i.e. Center and South are dominated by the presence of the firm that has all- India presence i.e. Grasim Industries. Ambuja Cements obviously has first ranking in the remaining three regions i.e. East, West and North.

What is more significant here, is the ranking of other firms, who although are on lower ranks in the overall index, have performed comparatively better in regional rankings. One such firm is Prism Cement Ltd., which has stood 4<sup>th</sup> in North and 3<sup>rd</sup> in Central region, the only two regions it caters inspite of having 6<sup>th</sup> rank in the overall index. This shows its good regional competitive performance. Birla Corporation Ltd. also has 4<sup>th</sup> rank in Centre, and 5<sup>th</sup> in North and East but 8<sup>th</sup> in overall rankings. One more point cannot be ignored is that there are many smaller firms operating in single or even two regions who are not included in the sample. Including them in the regional market sharing will definitely bring more competition.

Another observation here is that looking at the scores of the firms; it appears Western region of India witnesses most of the competition as first four of the firms in the competitive rankings operate there and fight for greater market shares. The other two firms in that region i.e. Century Textiles & Inds. Ltd. and Sanghi Industries Ltd. have vast difference of scores hence pose no threat to the four players. East too has all four firms competing with each other, but Birla Corporation Ltd. is on the fifth rank which appears to be competitive also.

**Table 12: Regional Competitiveness Rankings of Firms  
in Indian Cement Industry**

<b>NORTHERN REGION</b>	<b>RANK</b>	<b>SCORE</b>
Ambuja Cements Ltd.	1	68.77
Grasim Industries Ltd.	2	61.99
A C C Ltd.	3	60.72
Prism Cement Ltd.	4	53.41
Birla Corporation Ltd.	5	48.14
Shree Cement Ltd.	6	43.75
J K Cement Ltd.	7	31.32
Binani Cement Ltd.	8	31.08
<b>EASTERN REGION</b>	<b>RANK</b>	<b>SCORE</b>
Ambuja Cements Ltd.	1	68.77
Grasim Industries Ltd.	2	61.99
A C C Ltd.	3	60.72
Ultratech Cement Ltd.	4	60.24
Birla Corporation Ltd.	5	48.14
Century Textiles & Inds. Ltd.	6	31.77
O C L India Ltd.	7	25.91
<b>SOUTHERN REGION</b>	<b>RANK</b>	<b>SCORE</b>
Grasim Industries Ltd.	1	61.99
A C C Ltd.	2	60.72
Ultratech Cement Ltd.	3	60.24
India Cements Ltd.	4	54.73
Madras Cements Ltd.	5	52.28
Dalmia Cement (Bharat) Ltd.	6	45.15
Chettinad Cement Corpn. Ltd.	7	34.54
<b>WESTERN REGION</b>	<b>RANK</b>	<b>SCORE</b>
Ambuja Cements Ltd.	1	68.77
Grasim Industries Ltd.	2	61.99
A C C Ltd.	3	60.72
Ultratech Cement Ltd.	4	60.24
Century Textiles & Inds. Ltd.	5	31.77
Sanghi Industries Ltd.	6	31.68
<b>CENTRAL REGION</b>	<b>RANK</b>	<b>SCORE</b>
Grasim Industries Ltd.	1	61.99
A C C Ltd.	2	60.72
Prism Cement Ltd.	3	53.41
Birla Corporation Ltd.	4	48.14
Century Textiles & Inds. Ltd.	5	31.77

#### **4. CONCLUSION:**

It can be concluded that given the sustained growth in the housing sector, the government's emphasis on infrastructure (both at the national and the state level) and increased global demand, the prospect for India's cement industry is exceedingly promising. The dynamics of Indian cement industry is undergoing a gradual shift. From an oversupply situation not long ago, a phase has come where demand growth is outstripping supply.

While tracing the growth of the industry in different policy regimes, it became observable that the industry has matured with the help of all indicators of performance, such as size, production, capacity utilization, consumption and exports, after its decontrol in 1989-90. Technology of production and quality of product too has advanced a lot along with decrease in regional concentration. Another significant trend which the industry has witnessed is of greater consolidation of power by larger players through mergers and acquisitions and entry of foreign majors in the ever growing market. This growth and development of the industry is all the more evident in recent years especially after 1999-2000.

All the above mentioned trends in the Indian cement industry have only contributed to the growing competitiveness between the firms. The efforts have been made to build up a composite index that reflects the competitiveness of firms in the industry, indicating their areas of superiority and the domains of weaknesses. A composite competitiveness index is defined as the mathematical combination of individual indicators that represent different dimensions of the concept whose description is the objective of the analysis.

The findings of the study reflect the relative competitive position of the sample firms and also the overall picture of the industry. It also throws some light on the regional dominance of the players. Out of seventeen sample firms, performance of eight firms was above the industry average scores of overall competitiveness index. Ambuja Cement Ltd. scored highest in the group getting top most ranking mainly because of its consistent performance in both financial and non-financial index. This is followed by Grasim Industries, which has scored second rank due to better non-

financial performance in terms of sales and marketing strategy, etc. Looking at the financial and non-financial index separately, it is seen that the rankings differ a lot as some firms perform better in one than the other. In the regional rankings, it is learned that Northern, Western and Eastern markets are dominated by Ambuja Cement Ltd. whereas South and Central regions by Grasim Industries Ltd.

It can be hoped that the overall index, ten indicator indices and financial/ non financial index prove to be helpful in formulating competitive policies by the firms. It will also be useful to consumers to judge the competitive performance of these firms from the product quality and investment point of view.

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