



Partial Productivity Trends of Selected Indian Cement Companies

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ABSTRACT

The India Cement industry is one of the major industries in India. It is the oldest manufacturing industry in the modern sector of the Indian economy. It is one of the key, capital-intensive, energy and transport-intensive industries in India. India is the second largest among the cement producing countries in the world after China. At national level cement is one of the major industries in the core sector. With the progress of planned economic development of the country, there has been a tremendous increase in the demand for cement in all sectors with which its supply has not been able to keep pace. Therefore, to meet this increasing demand, cement industry has been assigned an important role and has been accorded a place of pride in the scheme of priorities for the development of industry. In view of all these an attempt has been made in this paper to study the productivity trends of selected Indian cement companies. From the analysis, it is evident that the labour productivity indices of all the selected companies have registered positive growth and are statistically significant, implying that the labour input has a positive influence on the production of all companies. It is also observed that the capital productivity indices of nine companies have registered positive growth and it indicates that there is a positive influence of capital productivity on production. The other three companies have registered negative growth implying that the capital productivity has a negative influence on the overall production.

Keywords : Capital Productivity, Labour Productivity, Capital Intensity

INTRODUCTION

Cement is a generic term used for all powdered material which, when mixed with water has a plastic form, but becomes a solid structure within a few hours. The structure gains strength and binding properties with age. History tells that lime and volcanic ash formed "Cement" used in the construction of classic Roman and Greek structures. Burnt gypsum was the cement used for the pyramids of Egypt. Evidence exists of its use in the Indus Civilization of Mohanjodaro. Cement was invented by Joseph Aspadin of Leeds, England, in 1824.

The India Cement industry is one of the major industries in India. It is the oldest manufacturing industry in the modern sector of the Indian economy. It is one of the key, capital-intensive, energy and transport-intensive industries in India. It is both a basic and consumer-based industry. It is an indigenous industry in which the country is well endowed with all the necessary raw materials, skilled labour, machinery, equipments, technology and know-how.

Cement plays a crucial role in the building operations. The industrial development and progress of a nation are directly related to the extent of its construction activities which are mainly dependent on consumption of cement. The consumption level of cement is an indicator of the country's progress and economic development. Significant increase in the production of cement and also a significant increase in the per capita consumption of cement are the yardsticks for measuring the country's overall development. The importance of cement industry may be summarized in the following ways.

OBJECTIVE OF THE STUDY

The growing importance and need for cement, an attempt has been made to study the selected Indian cement companies with the following objectives. The first objective of the study is to examine the productivity trends using partial and total fac-

tor productivity indices; and the second objective of the study is to examine the trends of capital intensity.

DATA BASE

For the present study 12 companies of the cement industry have been selected on the basis of their performance in terms of market share during the period 2000-2009. The study uses only secondary data. The data is drawn from the Centre for Monitoring Indian Economy (CMIE) – PROWESS data base. The prowess data base provides information on a large number of firms operating in the industrial sector. The study compiled the company level data on Output, Capital, Labour, Salaries and Wages, Raw material and Energy variables for estimating Partial and Total Factor Productivity of the following 12 Indian cement companies.

The study compiled the company level data on Output, Capital, and Labour, for estimating Partial Factor (Capital and Labour) Productivity and Capital intensity of following companies 1. A C C Ltd.(ACCL), 2. Birla Corporation Ltd.(BCL), 3. Cement Corporation of India Ltd.(CCIL), 4. Chettinad Cement Corporation Ltd.(CCCL), 5. Grasim Industries Ltd.(GIL), 6. Gujarat Sidhee Cement Ltd.(GSCL), 7. Heidelberg Cement India Ltd.(HCIL), 8. India Cements Ltd.(ICL), 9. Kalyanpur Cements Ltd.(KCL), 10. Madras Cements Ltd.(MCL), 11. Mangalam Cement Ltd.(MGCL), 12. Shree Cement Ltd.(SCL).

METHODOLOGY

Partial Factor Productivity and Capital intensity

Productivity is often measured as a ratio of output to inputs. The productivity of the industry can be measured in terms of the productivity of its constituent factors of production, such as labour and capital. However, the partial productivity measures have limitations as in situations where capital intensity is increasing overtime, partial productivity measures such as la-

bour productivity may show an increasing trend but this would be more a reflection of raising capital labour ratio rather than pure productivity increases.

In this section, labour and capital productivity indices have been computed to assess the efficiency of individual factor inputs. Besides the partial productivity indices of labour and capital inputs, the capital-labour ratio, popularly known as capital intensity, has also been computed for each cement company.

Partial labour productivity, capital productivity and capital intensity for the selected cement companies have been measured by taking the ratio of gross value added to labour, gross value added to fixed capital and fixed capital to labour respectively. Partial productivity measures can be computed as the ratio of output to factor input. The partial productivity indices have been computed as follows (Sharananjit Singh Dhillon, 1983).

$$P_L = \frac{V}{L}, \quad P_K = \frac{V}{K}$$

where P_L and P_K are the partial productivities of labour and capital respectively, and V is the value added, L is the labour and K is capital. We have also computed Capital intensity as

$$K = \frac{K}{L}$$

Annual growth rates of Partial factor productivity are estimated from the exponential method.

RESULTS AND DISCUSSIONS

Indices of labour & capital productivity and capital intensity

have been estimated and their growth rates are presented in the table- 1 & 2.

In ACC Ltd the capital productivity has decreased at an annual rate of 0.19 per cent. On the other hand, labour productivity and capital intensity are increasing at the rate of 13.36 per cent and 12.52 per cent per annum during the period respectively. In BCL Company, from the results reveal that the labour productivity and capital intensity are increasing at an annual rate of 10.72 per cent and 14.54 per cent per annum respectively and are significant at 1 per cent level. But the capital productivity declines at the rate of 3.83 per cent per annum.

The CCIL Company's capital productivity and labour productivity indices increased at the rate of 19.82 per cent and 28.43 per cent per annum respectively during the period 1999 to 2009 and are significant at 1 per cent level. The growth rate of capital intensity is 8.63 per cent and it is significant at 5 per cent level. From the analysis it is observed that the CCCL Company's labour productivity, capital productivity and capital intensity increased at the rate of 16.87, 6.68 and 10.16 per cent per annum over the entire period and are significant at 1 per cent level.

The labour productivity, capital productivity and capital intensity indices have registered a growth rate of -12.57, 14.60 and 27.15 per cent per annum respectively. All the three indices are significant at 1 per cent level for the GIL Company. The results reveal that the GSCL Company's labour productivity and capital productivity indices have registered a growth rate of 15.94 and 19.56 per cent per annum respectively and they are significant at 1 per cent level. The growth rate of capital intensity is 3.65 per cent per annum and it is significant at 5 per cent level only.

Table-1, Represents partial productivity indices and capital intensity indices of selected Indian cement companies.

CAPITAL PRODUCTIVITY INDICES												
YEAR	ACCL	BCL	CCIL	CCCL	GIL	GSCL	HCIL	ICL	KCL	MCL	MGCL	SCL
1999-00	100	100	100	100	100	100	100	100	100	100	100	100
2000-01	106	114	62	72	125	111	163	112	103	102	269	121
2001-02	102	124	109	67	112	141	182	92	88	123	298	83
2002-03	93	119	99	88	101	147	215	76	62	105	244	105
2003-04	93	129	111	105	110	147	219	50	75	118	321	109
2004-05	76	109	157	124	56	195	273	56	90	114	371	123
2005-06	113	81	231	116	55	194	301	71	93	138	405	113
2006-07	119	98	339	153	54	265	427	74	162	164	139	177
2007-08	99	94	373	128	46	422	315	77	198	110	260	319
2008-09	96	76	362	123	43	409	306	75	192	108	258	277
LABOUR PRODUCTIVITY INDICES												
YEAR	ACCL	BCL	CCIL	CCCL	GIL	GSCL	HCIL	ICL	KCL	MCL	MGCL	SCL
1999-00	100	100	100	100	100	100	100	100	100	100	100	100
2000-01	142	135	70	126	153	130	187	130	116	148	304	134
2001-02	162	148	191	144	184	161	210	106	92	190	349	83
2002-03	164	158	240	200	191	166	253	89	65	167	293	111
2003-04	187	179	338	306	220	157	246	122	77	193	375	114
2004-05	173	199	449	407	263	192	292	145	89	200	405	116
2005-06	278	192	606	392	262	295	274	208	84	243	499	109
2006-07	292	234	752	354	311	386	413	265	133	298	233	159
2007-08	318	272	813	385	421	564	528	346	144	326	537	194
2008-09	377	297	906	434	436	572	658	398	146	334	604	236
CAPITAL INTENSITY INDICES												
YEAR	ACCL	BCL	CCIL	CCCL	GIL	GSCL	HCIL	ICL	KCL	MCL	MGCL	SCL
1999-00	100	100	100	100	100	100	100	100	100	100	100	100
2000-01	118	118	112	175	122	117	115	116	112	145	113	111
2001-02	140	119	176	214	164	114	115	114	105	154	117	100
2002-03	156	132	243	229	188	113	117	117	105	159	120	106
2003-04	178	139	306	291	201	107	112	244	103	163	117	104

2004-05	202	182	287	329	470	98	107	258	98	176	109	94
2005-06	218	238	263	337	479	152	91	294	90	177	123	97
2006-07	218	239	222	231	579	146	97	357	82	182	168	90
2007-08	284	288	218	300	906	134	168	453	73	295	207	61
2008-09	346	389	250	352	1008	140	215	531	76	311	235	85

Source: Author's calculations

From the table-1 and 2, it is observed that the HCIL Company's labour productivity and capital productivity indices have registered a growth rate of 16.98 and 12.23 per cent per annum respectively and they are significant at 1 per cent level. Capital intensity recorded a growth rate of 4.78 per cent per annum and it is insignificant.

Company Name	Capital Productivity		Labour Productivity		Capital Intensity	
	ACGR	t- value	ACGR	t- value	ACGR	t-value
ACCL	0.19	0.13	13.36	10.76**	12.52	18.11**
BCL	-3.83	2.46*	10.72	14**	14.54	12.95**
CCIL	19.82	7.42**	28.43	9.98**	8.63	2.64*
CCCL	6.68	3.41**	16.87	6.79**	10.16	3.77**
GIL	-12.57	6.18**	14.6	12.72**	27.15	15.38**
GSCL	15.94	10.56**	19.56	10.25**	3.65	2.77*
HCIL	12.23	5.69**	16.98	8.9**	4.78	1.85
ICL	-3.87	1.55	16.11	6.16**	20.05	11.63**
KCL	9.03	2.7*	4.65	1.68	-4.37	5.57**
MCL	2.09	1.29	11.2	9.38**	9.95	6.27**
MGCL	3.72	0.77	12.01	2.81*	8.33	4.82**
SCL	12.17	4.07**	8.2	3.52**	-3.97	2.83*

*Indicates 5 % level of Significance and ** indicates 1 % level of significance

The above result shows that labour productivity increased at an annual rate of 16.11 per cent. It is significant at 1 per cent level whereas capital productivity registered a negative growth rate of -3.87 per cent per annum and it is not significant. The growth rate of capital intensity noted 20.05 per cent per annum and it is significant at 1 per cent level of the ICL Company.

Table-1 & 2 makes it clear that capital productivity has increased at the rate of 9.03 per cent per annum and it is significant at 5 per cent level. Labour productivity increased at an annual rate of 4.65 whereas the Capital intensity declined at the rate of -4.37 per cent per annum but it is significant at 1 per cent level of the KCL.

From the results reveal that the labour productivity and capital intensity have increased at the rate of 11.2 and 9.95 per cent per annum and are significant at 1 per cent level. Capital productivity shows insignificant growth of the MCL. In MGCL, labour productivity has increased at the rate of 12.01 per cent per annum and is significant at 5 per cent level. Capital productivity indices registered a growth rate of 3.72 per cent per annum during the period 1999 to 2009. Capital intensity rose at the rate of 8.33 per cent per annum and is significant at 1 per cent level. In SCL Company, labour and capital productivity indices registered growth rates of 8.12 and 12.17 per cent per annum respectively and are significant at 1 per cent level. Capital intensity declined at the rate of -3.97 per cent per annum.

CONCLUSION

Labour and capital productivity indices have been computed to assess the efficiency of individual factor inputs. Besides the partial productivity indices of labour and capital inputs, the capital-labour ratio, popularly known as capital intensity, has also been computed for each cement company. This ratio is not only of intrinsic interest as a measure of capital deepening but is also a determinant of labour productivity. For analytical purpose the data related to 12 cement companies in India during 1999-2009 have been selected.

The labour productivity, capital productivity and capital intensity for the selected Indian cement companies have been measured by using appropriate technique. It is concluded from the analysis that the productivity indices of all the selected companies have registered positive growth and are statistically significant at 5 per cent level implying that the labour input has a positive influence on the production of all companies. It is observed that the capital productivity indices of nine companies have registered positive growth and it indicates that there is a positive influence of capital productivity on production. The other three companies have registered negative growth implying that the capital productivity has a negative influence on the overall production.

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