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         REVIEW OF LITERATURE

         NEED/IMPORTANCE OF THE STUDY

         STATEMENT OF THE PROBLEM

         OBJECTIVES

         HYPOTHESES

         RESEARCH METHODOLOGY

         RESULTS & DISCUSSION

         FINDINGS

         RECOMMENDATIONS/SUGGESTIONS

         CONCLUSIONS

         SCOPE FOR FURTHER RESEARCH

         ACKNOWLEDGMENTS

         REFERENCES

         APPENDIX/ANNEXURE

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BOOKS
- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS
- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES
- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS
- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

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ECONOMIC VALUE ADDED PRODUCTIVITY OF MCL

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ABSTRACT

Cement industry is known to be one of the key industries for economic development. A well developed Indian cement industry built almost totally on domestic capital formation is modern, efficient and reasonably new and today accounts for a total production of around one hundred million tonnes. The industry is fully capable of meeting the demand of the country. The availability of cement however is kept a pace with increase in demand. The Madras Cements Limited (MCL) is one of the best units among the cement producing units. It maintains productivity to boost the production. The MCL considers the labour productivity, administration, selling and distribution productivity and so on. Productivity is one of the major parameter to cover the business activities. It is one of the key determinants of cost and price – competitiveness of firms and industries. Policy makers are interested in productivity movement particularly in the cement industry. In this paper an attempt is made to measure the operational efficiency in terms of productivity of MCL with the help of EVA productivity. It is calculated for the period from 2000-01 to 2010-11. It is used to ascertain whether the MCL's operational efficiency is high or low. Higher the percentage, higher is the efficiency.

KEYWORDS
Economic Value Added Productivity, MCL.

INTRODUCTION
The Madras Cements Limited (MCL) is one of the best units among the cement producing units. It maintains productivity to boost the production. The MCL considers the labour productivity, administration, selling and distribution productivity and so on. Productivity is one of the major parameter to cover the business activities.Productivity is a measure of the economic soundness of the means of production. It is one of the key determinants of cost and price – competitiveness of firms and industries. Policy makers are interested in productivity movement particularly in the cement industry. Productivity is the relationship between physical output and one or more of the physical input used in production process. It is expressed as a ratio to reflect how efficiently resources are used in creating outputs. Productivity measurement enables the firms to compare themselves and provide perspective of firm's financial data.In this paper an attempt is made to measure the operational efficiency in terms of productivity of MCL with the help of EVA productivity.It is calculated for the period from 2000-01 to 2010-11. It is used to ascertain whether the MCL's operational efficiency is high or low. Higher the percentage, higher is the efficiency.

STATEMENT OF THE PROBLEM
The cement industry is highly a capital and energy intensive industry. Lime stone is its basic raw material and cement is a highly price sensitive commodity. Hence, the location of a cement plant is determined by the availability of limestone and proximity to the market.Coal is a basic necessity but the industry does not claim any priority on the supply of coal for its use. The entire requirement of coal by the cement industry is met with full allocation of linkage quality. Power is another important input, which the cement industry needs. The state electricity boards are permitted to raise cost of power while supplying to cement industries and the cement industry continues to suffer on this account. Cement is made by combining limestone, clay, gypsum and laterite in specific proportions grinding the mixture and then heating it to a high temperature. It is used as a raw material for construction of buildings, dams, canals, laying of roads, preparing for cement tubes and so on. In India, cement industries are owned by the State Government, Central Government and Private entrepreneurs. Cement industry plays a vital role in the economic development of the country. Finance is required for all business. The MCL is not an exemption too. Equity shares, retained earnings and reserves and borrowed capital are the main sources of funds for MCL. It utilizes the funds effectively. It has remarkable achievements in production, productivity, profitability and selling of cement. Hence an attempt has been made to analyse the operational efficiency in terms of productivity of MCL with the help of EVA productivity.

REVIEW OF LITERATURE
There are number of studies which have been undertaken previously. Such studies are highly useful to identify the areas already investigated and formulate insight into the present study. A review of few important studies is given under below:
I.C. Arya[1] has dealt in his article the returns to scale, the marginal productivity of inputs and their relative contribution and elasticity of output with respect to inputs in Indian cement industries.
Balaji K. Moorthy and A.V. Dharmakrishnan[2] dealt in their paper that the Indian cement industry is second in the world in terms of quality, productivity and efficiency. The industry leaders have never hesitated in investing in technology to ensure not only quality and productivity but also protection of the environment.
G.K. Devaraj[3] has pointed out in his article that the productivity was the key determinant in production of a mill and it applied equally to labour as well as machine productivity.
C.B. Gupta[4] has rightly pointed out that productivity is the ratio of net value of output to the net value of input, all expressed at constant prices. He advocated factor productivity indices to measure the efficiency of individual operations or specific factors of production. Productivity indices for individual inputs were computed.
A.K. Jain[5] in his paper focussed the technological improvements, energy conservation, environmental practices, marketing and distribution of cement.
H. Kaynak and M.J. Mccraken[6] have examined the quality, productivity, relationship using a production simulation game which discussed a variety of measures of both quality and production, including the relative cost of materials and labour. Their article finds that as quality increases, productivity increases, thus productivity and quality are directly related.

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S. Muthukrishnan[7] has stated that the Indian cement industry is the fourth largest in the world after China, US and Japan. China accounts for roughly one-third of the global capacity while India is close to six per cent share. The sector-wise analysis of operational efficiency has revealed that the performance of private sector cement companies was more outstanding than that of the public sector cement company. He has found out that the growth of labour productivity and capital intensity was more in the private sector than in the public sector.

National Productivity Council Research Division[8] has analysed the Productivity and Performance of the Industry with a view of identifying the major problem areas and the prospects of solving them.

B.K.S. PrakashRao and B.H. Venkateswara Rao,[9] in their article enlighted that the vigorous growth of the cement industry has been facilitated by a substantial increase in consumption from infrastructure, housing and industrial projects. The industry can expect to see good years ahead in the longer time.

S. Rajamohan and T. Vijayaragavan[10] have stated that India exports cement to around 25 countries, which include not only SAARC countries but also countries in West Asia, Africa, Europe, Australia and few Islands of the Indian Ocean. Commencing with a mere 1.5 lakh tonnes in 1989-00, exports grew to 9 million tonnes in 2003-04 and further to 10 million tonnes in 2004-05.

S. Rajamohan and T. Vijayaragavan[11] have described the production, capacity utilization and per capita consumption of cement over the years.

R.K. Sharma[12] pointed out in his paper that "The Overall Efficiency and Productivity of an Organization are the Outcome of the Effectiveness of Workforce".

OBJECTIVES OF THE STUDY
The objectives of the study are:
1.   To examine the productivity management of MCL
2.   To offer suggestions based on findings of the study

SCOPE OF THE STUDY
The Madras Cements Limited is engaged in the production of cement and limestone. It has four branches spread over in Tamil Nadu, Andhra Pradesh and also in Karnataka. Besides, it undertakes development works in many areas. However the accounts are prepared and submitted under one head namely "Annual Account of Madras Cements Limited.The study is undertaken from the point of view of "Economic Value Added Productivity of MCL."

METHODOLOGY
This study is the blend of both the descriptive and the analytical methods. Annual reports for the ten years have been collected to study the EVA productivity of this unit. Besides, the researcher has met some of the officials of the study unit to identify its significance.

FRAMEWORK OF THE ANALYSIS
The MCL is one of the top most cement manufacturing company in India. They perform the work on target. They accept the changes and challenges. They maintain productivity, solvency and profitability in all the years of study. Hence, the simple tools like ratios, mean, standard deviation, co-efficient of variation, linear growth rate, compound growth rate and annual growth rate have been used for analysing the data.

ECONOMIC VALUE ADDED (EVA) PRODUCTIVITY
Productivity is the real index of efficiency of an organisation. It is considered to be a good proxy for efficiency. Economic Value Added (EVA) productivity has been used to analyse the operational efficiency of the study units. It is a powerful measure of performance through an operational profitability, as profitability is related to productivity. Hence, EVA productivity has been determined by using the following:

EVA   = Net Profit after Tax – Cost of Capital [1]

COST OF CAPITAL
The term 'Cost of Capital' refers to the minimum rate of return a firm earns on its investment. The cost of capital is computed by using both the cost of equity and the cost of debt. The MCL has equity shares and debt capital for which these two capitals are used to compute cost of capital.

COST OF EQUITY
The equity share holders invest money on shares with the expectation of getting dividend from the company. The market price of the equity shares normally depends on the companies return. The term 'Cost of Equity' refers to the minimum rate of return that the firm must earn on the equity financed portion of an investment. The cost of equity is computed by adopting the following formula:

$$K_e = \frac{DI}{NP} \times g$$

Where, Ke   = Cost of equity rate, DI = Dividend for the period
NP = Net proceeds of equity, g   = Dividend growth rate

COST OF DEBT
The debt capital is the safest financial asset. This may be issued and redeemed at par, at premium or at discount. The term 'Debts' include the secured and unsecured loans. The cost of debt is computed by using the following formula:

$$K_d = \frac{I}{NP} (1-T)$$

where, kd = Cost of debt rate,   I = Interest paid in period
NP   = Net proceeds of debts, T= Company tax rate

CAPITAL STRUCTURE WEIGHTS
Capital structure weights are determined by dividing the book value of each capital source by the sum of the book value of the long term capital sources and expressing them as a rate. Two rates namely, equity rate and debt rate are determined by using the following formula:

$$\text{Capital structure weights for } K_e = \frac{S}{S+B} \times K_e$$

$$\text{Capital structure weights for } K_d = \frac{B}{S+B} \times K_d$$

where,
S   = Total book value of equity, B= Total book value of debt
S+B   = Total book value of the firm, Ke= Cost of equity
Kd   = Cost of debt

RESULTANT COST OF CAPITAL
This is the next step to ascertain EVA productivity. The resultant cost of capital is not a cost of capital but it is computed based on the cost of capital. It is one of the important tool which is used to measure the efficiency of any organization. It can be calculated by using the following formula:

Resultant Cost of Capital   = Total capital x weighted average cost of capital

weighted average cost of capital = (Equity capital x capital structure weight) + (Debt capital x debt structure weight)

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ECONOMIC VALUE ADDED (EVA) PRODUCTIVITY

Economic Value Added (EVA) productivity is the quantum of economic value generated by a company in excess of its cost of capital. Mathematically, it is the difference between the net profit after tax and capital charge. Economic Value Added (EVA) productivity is one of the range of performance measurement tool. Anyhow more the net profit and more will be the EVA. Similarly less the resultant cost of capital and more will be the EVA productivity.

CORRELATION MATRIX

The MCL is one of the best manufacturing company in India. It is giving importance to productivity. There are number of variables involved to improve the productivity. Hence, in order to find out how these factors are correlated with each other, the correlation matrix has been used. There are 5 variables which are given both in rows and columns. The results are given in two ways such as over all correlation between the variables and the degrees of significant relationship at 5% and 1% level.

FINDINGS OF THE STUDY

This paper presents the findings in list form because EVA productivity managementis analytical in character.

1. The difference between the net profit and cost of capital is called EVA. In order to compute EVA, the cost of capital, cost of equity, cost of debt, capital structure weights and resultant cost of capital are taken into consideration. Because these are the components of EVA. The result of such variables are given below:

a) The MCL has declared the dividend of Rs.725.70 lakhs initially for the period of two years and thereafter they have increased. In all the study period the dividend of MCL declare a consistent dividend. It is important to note that the company maintained the dividend growth rate of 0.105 per cent in all the years of study. It had not issued further shares because, there were only little changes in equity capital. The cost of equity is fluctuating between Re.0.7060 and Rs.0.1820

b) The debt capital, interest and cost of debt were fluctuating in trend because these are closely related. Of the 10 years, the company maintain more than the average cost of debts in four years. The linear growth rate, compound growth rate and annual growth rate are in negative.

c) The capital structure weight for cost of equity and debts were in fluctuating trend because it depends on book value of equity, debts and its cost. The average capital structure weight for cost of equity and cost of debts are Re.0.0099 and Re.0.0356 respectively.

d) The resultant cost of capital is in fluctuating trend which are ranging between Rs.4593.77 lakhs and Rs.8963.23 lakhs.

e) It is found that the EVA productivity was negative in two years. The maximum EVA productivity was Rs.37490.74 lakhs in 2007-2008 followed by Rs.29342.36 lakhs in 2006-2007.

f) The EVA productivity stood at Rs.-1727.54 lakhs increased to Rs.12134.77 lakhs in 2010-2011. The average EVA productivity was Rs.14386 lakhs with the standard deviation of Rs.14567 lakhs.

2. Capital structure weight of cost of equity and cost of equity (0.995) have high degree of positive correlationand EVA productivity and capital structure weight of cost of debt (-0.6948) have negative correlation. It is also found through correlation matrix that capital structure weight of cost of debt (0.3683) and cost of debt (0.6998) have a significant effect at 5 per cent level. EVA productivity (1.000) and cost of equity (-0.714) have significant effect at 1 per cent level.

SUGGESTIONS

"No pain, no gain", holds good in manufacturing companies. The MCL is not an exemption too. Of course, this industry is doing its level best to boost production, sales, profit, reduce cost of production, maintain quality of products and provide good services to the consumers. It has good and qualified team of officials to do the necessary services. The following are the important suggestions of the study:

1. In order to get betterment in overall productivity, the reduction in administration and selling and distribution expenses is very essential. Over the study period, the said expenses have increased gradually year by year. Therefore, MCL should concentrate to control these expenses.

2. The MCL should use modern material handling and production techniques to get better productivity.

3. Cement industries require more energy for production. Hence, they should form solar plant to generate electricity.

4. The present paper is a novel attempt to study the EVA productivity management of MCL. The findings and suggestions of the present study will be highly useful to the officials of MCL to improve the financial position.

CONCLUSION

Productivity is a measure of the economic soundness of the means of production. The measurement levels of productivity and the growth rate of productivity assume critical importance. The EVA is used to study the operational efficiency. The cost of equity, cost of debt, capital structure weight and soon have been used to ascertain EVA.

TABLE – 1: COST OF EQUITY OF MCL

Year	Dividend (DI) (Rs. in lakhs)	Net Proceeds of Equity (NP) (Rs. in lakhs)	Dividend Growth Rate (G) (%)	Cost of Equity (Re.)
2001-02	725.70	1207.55	0.105	0.7060
2002-03	725.70	1207.78	0.105	0.7059
2003-04	907.13	1207.78	0.105	0.8561
2004-05	1209.50	1207.78	0.105	1.1064
2005-06	1814.25	1207.79	0.105	1.6071
2006-07	1814	1207.78	0.105	0.1577
2007-08	2419	1109.27	0.105	0.2133
2008-09	2383	2379.69	0.105	0.1051
2009-10	3575	2379.69	0.105	0.1577
2010-11	4125	2379.69	0.105	0.1820

RESULT

Mean (Re.)	Standard Deviation (Re.)	Co-efficient of Variation (%)	Linear Growth Rate (%)	Compound Growth Rate (%)	Annual Growth Rate (%)
0.5797	0.5072	87.49	-3.6	-12.69	-7.422

Source: Annual Report of MCL

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TABLE – 2: COST OF DEBT OF MCL

Year	Interest (I) (Rs. in lakhs)	Net Proceeds of Debts (NP) (Rs. in lakhs)	I-T (%)	Cost of Debt (Re.)
2001-02	7750.48	73609.60	0.60	0.0632
2002-03	6617.58	70499.98	0.65	0.0329
2003-04	4960.34	61421.20	0.65	0.0525
2004-05	3588.92	69096.50	0.65	0.0338
2005-06	3435.16	60244.19	0.65	0.0371
2006-07	2283	67733	0.65	0.0219
2007-08	5170	163564	0.65	0.0205
2008-09	11001	246345	0.65	0.0290
2009-10	15088	256651	0.65	0.0382
2010-11	13928	279117	0.65	0.0324

RESULT

Mean (Re.)	Standard Deviation (Re.)	Co-efficient of Variation (%)	Linear Growth Rate (%)	Compound Growth Rate (%)	Annual Growth Rate (%)
0.0362	0.0131	36.19	-130	-6.46	-4.8734

Source: Annual Report of MCL

TABLE -3: CAPITAL STRUCTURE WEIGHT FOR COST OF EQUITY (KE) AND COST AND DEBT OF (KD) OF MCL

	Capital Structure Weight for Cost of Equity				Capital Structure Weight for Cost of Debt			
	S (Rs.in lakhs)	(S+B) (Rs.in lakhs)	K_e (Re.)	C.S.W.for ($K_{e(Re.)}$)	B (Rs.in lakhs)	(S+B) (Rs.in lakhs)	K_d (Re)	C.S.W.for K_e
2001-02	1207.55	74817.15	0.7060	0.0114	73609.60	74817.15	0.0632	0.0622
2002-03	1207.78	71707.76	0.7059	0.0119	70499.98	71707.76	0.0329	0.0323
2003-04	1207.78	62628.98	0.8591	0.0165	61421.20	62628.98	0.0525	0.0515
2004-05	1207.78	70304.28	1.1064	0.0190	69096.50	70304.28	0.0338	0.0332
2005-06	1207.79	61451.98	1.6071	0.0316	60244.19	61451.98	0.0371	0.0364
2006-07	1207.78	68940.78	0.1577	0.0028	67733	68940.78	0.0219	0.0215
2007-08	1109.27	164673.27	0.2133	0.0014	163564	164673.27	0.0205	0.0204
2008-09	2379.69	248724.69	0.1051	0.0010	246345	248724.69	0.0290	0.0287
2009-10	2379.69	259030.69	0.1577	0.0014	256651	259030.69	0.0382	0.0378
2010-11	2379.69	281496.69	0.1820	0.0015	279117	281496.69	0.0324	0.0321

RESULT

Mean (Re.)	Standard deviation (Re.)	Co-efficient of variation (%)	Linear Growth Rate (%)	Compound Growth Rate (%)	Annual Growth Rate (%)
0.0099	0.0103	104.04	-170	-18.36	-8.6842
0.0356	0.0128	35.96	-140	-6.4	-4.8392

Source: Annual Report of MCL

TABLE – 4: RESULTANT COST OF CAPITAL OF MCL

Year	Total Capital (Rs. in lakhs)	Weighted Average Cost of Capital (Re.)	Resultant Cost of Capital (Rs. in lakhs)
2001-02	74817.15	0.0614	4593.77
2002-03	71707.76	0.0320	2294.65
2003-04	62628.98	0.0508	3181.55
2004-05	70304.28	0.0330	2320.04
2005-06	61451.98	0.0363	2230.71
2006-07	68940.78	0.0212	1459.64
2007-08	164673.27	0.0203	3338.26
2008-09	248724.69	0.0284	7072.48
2009-10	259030.69	0.0375	9704.74
2010-11	281496.69	0.0318	8963.23

RESULT

Mean (Rs.in Lakhs.)	Standard deviation (Rs.in Lakhs)	Co-efficient of variation (%)	Linear Growth Rate (%)	Compound Growth Rate (%)	Annual Growth Rate (%)
4515.9	2995	66.32	0.0007	6.91	9.5117

Source: Annual Report of MCL

TABLE – 5: ECONOMIC VALUE ADDED (EVA) PRODUCTIVITY OF MCL

Year	Net Profit after Tax (Rs. in lakhs)	Resultant Cost and Capital (Rs. in lakhs)	EVA (Rs. in lakhs)
2001-02	3866.23	4593.77	-727.54
2002-03	2148.20	2294.65	-146.45
2003-04	4997.80	3181.55	1816.25
2004-05	5202.44	2320.04	2882.40
2005-06	8352.03	2230.71	6121.32
2006-07	30802	1459.64	29342.36
2007-08	40829	3338.26	37490.74
2008-09	36352	7072.48	29279.52
2009-10	35368	9704.74	25663.26
2010-11	21098	8963.23	12134.77

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RESULT

Mean (Rs. in lakhs)	Standard Deviation (Rs. in lakhs)	Co-efficient of Variation (%)	Linear Growth Rate (%)	Compound Growth Rate (%)	Annual Growth Rate (%)
14386	14567	101.26	0.0002	157.59	176.79

Source: Annual Report of MCL

TABLE – 6: CORRELATION MATRIX

Particulars	EVA Productivity	Capital Structure Weight for (ke)	Capital Structure Weight for (kd)	Cost of equity (ke)	Cost of debt (kd)
EVA Productivity	1.00				
Capital Structure Weight for (ke)	-0.6917	1.00			
Capital Structure Weight for (kd)	-0.6948	0.3683	1.00		
Cost of equity(ke)	-0.7140	0.9950	0.3795	1.00	
Cost of debt(kd)	-0.6998	0.3758	0.9990	0.3866	1.00

Source: Compiled from Annual Report of MCL

Note: Statistical Computations have been done through SPSS

Note: (*) Significant at 5% level

Note: (**) Significant at 5% level

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