

A study of Ratio Analysis and role of Working Capital Management on Efficiency and Profitability of Cement Companies in Gujarat

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Abstract- The purpose of this paper was to analyse the role of working capital management on efficiency and profitability of cement firms in Gujarat. This paper attempted to analyse that whether there had been a significant difference in the efficiency and profitability of cement firms as a result of better working capital management. This study included a sample of 4 cement manufacturing firms in Gujarat. This study involved a two-stage methodology. In the first part, one way ANOVA test was used to investigate the significant difference in efficiency and profitability. In the second part of methodology, the focus was given to check the impact of inventory turnover ratio on profitability of the companies using correlation matrix. The results shown that there was a significant difference in efficiency except working capital turnover ratio. It was also found that two companies had a positive correlation between inventory turnover ratio and profitability ratios whereas other two companies had negative correlation. These results are recommended to financial institutions, banks and executives. The study finds that working capital management leads to improvement in the efficiency and profitability of the firms.

Keywords: working capital management, liquidity, profitability, efficiency, ANOVA

INTRODUCTION

Working capital considered to be the core to whole system, holds an important place in the theory of financial management. Its efficient and effective use has a direct bearing on the wealth maximization objective as also on the achievement of other objectives of the corporate entity. On the very same token, inefficient and unproductive management of working capital may result not only in loss of returns but also in final collapse of what otherwise might be considered as a profitable concern. In every

company, the working capital task ought to subsist in some form or the other. Working capital management, as a very important component of corporate finance, directly influences the liquidity and profitability of a concern. Breakdown of a company is unquestionable with its pitiable management or managing proficiency.

Working capital management is the process of planning and controlling the level and mix of current assets of a firm as well as financing of these assets during the normal course of a business. In this process of planning and controlling the level and mix of current assets, the focus is placed on determining the optimum size and mix of various current assets and financing mix of current assets in such a way that neither the profit nor the liquidity is compromised. Thus, it follows that efficient and effective working capital management in terms of adequate size of working capital and adequate mix of financing of working capital plays an important role in maintaining the financial health of a business concern by maintaining the solvency, liquidity, profitability and goodwill of a business.

Thus, working capital management is associated with the sustained survival of a company; not withstanding production of quality goods and services, use of efficacious selling techniques, employing of consummate technologies and proficient human resource management. Working capital is the only investment a company makes without expecting a defined return. The investment is needed in order to keep the business going rather than to produce something from itself. Growing sales, dividend proclamation, extension of plant, adding fresh product line, increasing remuneration of workers, increasing the price level of a product, etc places an additional burden on working capital management. Shortage of funds for working capital

as well as the uncontrolled over expansion has caused many businesses to fail and in less severe cases, has stunted their growth. Especially in small firms, working capital management may be the decisive factor for success or failure; in large firms, efficient working capital management can significantly affect the firm's risk, return and share price.

LITERATURE REVIEW

Batra and Sharma (2001) have studied working capital management practices in Goetze India Limited over the period 1989-90 to 1993-94. Their study revealed that the overall position of working capital management was satisfactory but there were some gaps in management of inventory, receivable and payable which needed improvement.

Singh Swaran and Dr Bansal S. K. (2013) carried out their study on the structure of working capital, the management of inventory, accounts receivable, accounts payable and cash. The data from the published annual reports of IFFCO and KRIBHCO starting from the year 1999-00 to 2006-07 was taken for the study. The analysis done with the help of various ratios, concluded that the working capital management of IFFCO was better than KRIBHCO.

Dr Panigrahi Ashok Kumar (2018) studied the working capital management of ACC Cement Company, for assessing its impact on profitability during the period 1999-2000 to 2018-10. The study, based on secondary data, concluded that there is a moderate relationship between the working capital management and profitability of the firm.

K Madhavi (2014) pointed out the role of working capital management in profitability as well as liquidity of the firm. The study makes a comparative analysis of two paper mills in Andhra Pradesh to examine and evaluate their financial position, solvency, liquidity, efficiency and profitability by adopting ratio analysis for the period 2002 to 2014. The study brings in focus the need for an effective utilization of cash balances.

(Babu et.al 2014) in their research paper "Study on the Working Capital Management Efficiency in Indian Leather Industry- An Empirical Analysis" They found a positive and insignificant relationship of inventory conversion period and profitability and also average collection period is positive relationship with power but statistically significant. Even though, average payment period and cash conversion cycle were significant negatively related

to profitability. Further the result of this study examined that for overall leather industry, working capital management has important force on productivity of the companies. These results suggest that managers can generate worth for their shareholders by reducing the number of day's accounts receivable and increasing the account payment period and inventories to a reasonable maximum.

(Ganesen 2007) "An Analysis of Working Capital Management Efficiency in Telecommunication Equipment Industry" concluded that the working capital management competence is pessimistically correlated to the liquidity and profitability. By decreasing days of working capital it clearly improves the working capital management efficiency, profit margin of the telecommunication firms improved. It is observed that there is no significant statistical evidence to support the hypothesis that the firms in telecommunication equipment industry manage all the three components of WCM equally. Overall there is evidence that the working capital management efficiency in telecommunication industry is poor. It is recommended that the telecommunication industry should improve working capital management efficiency by concentrating on reducing inventory and improving DPO by getting more credits from suppliers.

(Chhapra, Naqvi 2013) in their research title "Relationship between Efficiency Level of Working Capital Management and Profitability of Firms in the Textile Sector of Pakistan" They concluded that working capital management plays a significant role in productivity, efficiency and profitability of textile sector of Pakistan. There is a positive impact except cost of debt on profitability. Again concluded that that particular norms for WCM should be followed to reduce the market risk and liquidity. Furthermore, financial information system should be set up to build up financial discipline in WCM and financial forecasting; planning and control plans are to be more intensive to enhance the efficiency of cash management.

Gurumurthy N. and Reddy Jayachandra K. (2014) conducted a study on the working capital management of four pharmaceutical companies and concluded that the existing system of working capital management in the selected pharmaceutical companies was not satisfactory and hence, needed improvement

Profitability, when expressed as a chance of means or investments, enables peer comparison and assists in decision timber. ROA has been one of the most extensively used measures of account- grounded fiscal performance (Chowdhury & Amin, 2007; Rahman, 2011; Makori & Jagongo, 2013; Gaur & Kaur, 2017).

Deloof (2003) supported for the use of operating income rate to measure fiscal performance. But ROA incorporates the operating gains of the company as well as utilisation of available means in generating similar gains (Makori & Jagongo, 2013) and hence can be viewed as a comprehensive measure of profitability (Padachi, 2006). Following the studies from Senanayake, Dayaratna, and Semasinghe (2017) and Vartak and Hotchandani (2019), the study adopts ROA as the account-grounded measure of fiscal performance. Liberal credit policy can increase deals which further boosts profitability, but it also extends the CCC, which is used as a wide- ranging measure of WCM of the establishment. Hence, companies have to trade- off between profitability and liquidity. Advanced cash holding enables companies to avoid high- cost backing and also provides autonomy in decision (Vijayakumaran & Atchyuthan, 2017).

Sharma and Kumar (2011) have concluded an analogous positive relationship for Indian corporates by considering a large data set of 263 listed companies. The direct relationship between profitability and CCC is relatively uncommon in empirical exploration and has been contradicted by the findings of Rahman (2011), Goel and Jain (2017) and Vartak and Hotchandani (2019). A longer conversion cycle may be the result of inefficiency in the product process and detention in entering payments. CCC as a compound measure cannot help in decision making directly because of its inclusiveness, and thus, it has to be broken down into sub-parts, vicelike inventory conversion period (ICP), average collection period (ACP) and creditor disbursement period (CDP).

Research studies from Ganesan (2007), Muhammad et al. (2008) and Aggarwal and Chaudhary (2015) have stoked the single measure of WCM, i.e., CCC, by incorporating activitywise conversion time to help directorial decision timber. Holding force for a longer span of time is an index of poor fiscal performance as enterprises with deteriorating gains find their stock position enhancing (Deloof, 2003; Garcia- Teruel & Martinez- Solano, 2007; Sharma & Kumar, 2011). The detention in payments

negatively affects the profitability and credit worthiness of an organisation, and hence profitable enterprises prefer to discharge their scores on time (Vartak & Hotchandani, 2019). On the negative, loss- making enterprises struggle to pay their pretences and hence longer CDP negatively affects profitability (Ganesan, 2007; Muhammad et al., 2008; Seyoum, Tesfay, & Kassahun, 2016).

In addition to the phases of operating cycle and time period involved, the working capital policy can be analysed using an exertion rate expressed as a frequency rather than number of days. Rehman and Anjum (2013) and Gaur and Kaur (2017) have considered current ratio, acid- test ratio, current assets to total assets and current assets to sales ratio as exploratory variables and assessed their impact on financial performance. Both exploration studies have verified a positive relationship between working capital operation and the profitability of enterprises. inclusively, this section highlights the significant impact of WCM on enterprises' performance; still, it also reveals that the exploration findings aren't harmonious.

Market-based performance measures like the P/E ratio, market-to-book value ratio, and Tobin's Q ratio can be used to determine a company's value. Tobin's Q ratio has been the most widely applied indicator of these in prior research (Nazir & Afza, 2009; Abuzayed, 2012; Altaf & Ahmed, 2019). Q ratio has better distribution features than other metrics (McGahan, 1999) and incorporates the reputational value benefits of organisations' WCM capabilities on performance (Afrifa & Tingbani, 2018). As a result, the study uses the Q ratio as a gauge of market-based financial success in accordance with the body of existing literature. Investor's rate senior management's competency in managing working capital concerns, and the market price of shares reflects this.

According to the research of Abuzayed (2012) and Afrifa and Tingbani (2018), stockholders place a negative value on lengthier CCC since an investment in working capital necessitates the use of outside money, which raises the cost of borrowing. In their 2009 study, Nazir and Afza evaluated the impact of working capital financing and investment on the creation of value for shareholders and established the large beneficial impact of aggressive financing policy on the Q ratio. However, Altaf and Ahmed (2019) discovered an inverted U-shaped link between working capital financing and Tobin's Q ratio. They have come to the conclusion that

financial performance is improved (deteriorated) by a low (high) amount of working capital finance through short-term borrowings. The discussion above suggests that investor's view WCM as value-relevant when assessing a company's success. However, less research has been done in this field, particularly in developing nations like India.

Need for the Study

At this juncture, it is required to justify as to why the present study is undertaken. It is pertinent to note here that the Gujarat cement industry, which has been taken up for investigation in the present study, is a very important industrial sector which fuels, supports and sustains the wheel of economic growth in India. Significance of cement industry in context to other industries and to the industry driven development of the economy, in no manner can be underestimated and thus, cannot be let go uncared for. It lubricates and strengthens the engine of economic development thereby, facilitating all the sectors of the economy to speed up their growth rate. After the liberalization of the economic policies in the 1990s coupled with the deregulation of the cement industry, the structure of the industry has changed significantly in India. The role of the government is no longer that of a regulator, rather of a facilitator to the development of the industry by removing bottlenecks and making the sector globally competitive. This has resulted into enormous growth of the Indian cement industry in the post 1990 period.

It is worth noting here that there exists a very strong relationship between the level of economic growth and the quantum of cement consumption in India. Today, India is the second largest producer of cement in the world accounting for production of 103.13 million tonnes of cement. With a very strong prevailing demand scenario and an equally strong future demand potential, the Indian Iron and cement industry has grown at an exceptionally fast pace in the recent decades. Enormous growth of the Indian cement industry has resulted into huge amount of working capital investment in current assets of the Indian cement companies. In the face of huge working capital investment in cement companies in India, it would be pertinent to examine the productive use of the so invested capital.

Since we know that the cement industry is characterized by high capital intensity, high dependence on bulk raw materials, and cyclical growth trends, therefore, the industry is always

exposed to and vulnerable to threat of overcapacity and relatively low profitability when cyclical movements are adverse. This is the reason why the problems associated with the cement industry are generally complex given their criticality to nation building. Owing to these perpetual threats and challenges associated with the cement industries and keeping in view the size of investment in working capital of this industry, it would be quit essential to analyse the management of working capital so as to know about its level of operational efficiency and also to utilize the maximum available resource to increase the rate of return on investments. It is in this context the present study has been undertaken to analyze the working capital management of prominent cement producing companies of the cement industry in Gujarat.

Objectives of the Study

1. To examine the effect of ratio relating to working capital management on firms.
2. To study the management of working capital of selected cement companies with a view to better understand the overall operational efficiency
3. To analyse that whether there had been a significant difference in the efficiency and profitability on cement firms.

Methodology

Sample Design

The cement industry is huddled with several types of players which present such a diverse milieu that cannot be reasonably compared for discerning any meaningful information. Therefore, in order to discern meaningful information, we decided to select only the prominent players of the industry. For the purpose of the selection of the cement players, which could be comparable amongst themselves, the sampling method has used the following factors:

1. The installed capacity of the company should be at least three million tonnes of cement production per annum,
2. The company must be an integrated cement producer (primary producer),
3. The company is listed on the stock exchange in India,
4. The data of the company is available for the entire study period ranging between 2011-12 and 2020-21, and
5. The net worth of the company is not below Rs. 10,000 crore.

Sources of Data

Given the objectives of the study, the study is based on secondary data. The secondary data is taken from published Annual Reports of the Selected Cement Companies, World Cement Association Reports, Reports published by Ministry, and CMIE Prowess Database. Period of the Study

The study covers a ten-year span from 2011-12 to 2020-21. It was thought appropriate to consider the period of the study over a decade. The idea has been to assess the working capital management of the selected cement companies in the background of global crisis and pandemic with a view to discern the trends and changes over the period of ten years since the year 2011-12. As such, the period of the study has been so taken which presents a complete and updated picture of the working capital management in the selected cement companies of the cement industry in Gujarat.

Tools of Analysis

In keeping with the objectives of the study, we have worked out and analysed the accounting ratios relevant to working capital management. Apart from this, we have used statistical tools and techniques as warranted by the data and objectives of the study. The important statistical tools used for the purpose of analysis include the Analysis of Variance (ANOVA) and correlation analysis. The use of all these techniques at different places have been made in the light of nature and suitability of data and the requirements of analysis.

Research Hypotheses of the Study

In order to have an overall picture over the years as

also to have a comparative picture of working capital management of selected cement companies, the study has formulated and tested the following hypotheses:

- 1- H0: Working Capital Management has no significant impact on efficiency and Profitability of cement companies in Gujarat.
- 2- H0: There is no relationship between inventory management and profitability of cement companies in Gujarat.

In this current study we have identified dependent and independent variables. For identify the relationship between inventory management and profitability variables mentioned below-

Independent Variable: Inventory Turnover Ratio
 Dependent Variables: Debtors Turnover Ratio, Working Capital Turnover Ratio, Assets Turnover Ratio

For analyse/ identify the relationship between operating cycle period and profitability variables mentioned below-

Independent Variable: Inventory Turnover Ratio
 Dependent Variables: Operating profit ratio, Net Profit Ratio, Gross profit Ratio

RESULTS AND FINDINGS

The following ratios have been calculated in order to analyze the working capital management efficiency of selected cement companies. These are:

- i. Inventory turnover ratio.
- ii. Debtors turnover ratio.
- iii. Working capital turnover ratio.
- iv. Assets turnover ratio.

Table1: Inventory Turnover Ratio

Years	Ambuja Cement	Ultratech	Tata	JK
2012	17.67	5.9	8.68	6.08
2013	22.46	11.25	10.22	5.89
2014	21.62	11.28	10.02	7.08
2015	21.79	13.51	12.91	6.12
2016	26.43	17.94	11.07	6.53
2017	28.65	15.38	9.78	6.96
2018	21.08	16.87	8.23	7.38
2019	20.77	16.22	9.26	8.06
2020	23.69	17.18	8.83	8.12
2021	25.94	18.3	9.39	8.31
TOTAL	230.1	143.83	98.39	70.53
MEAN	23.01	14.383	9.839	7.053
S.D	3.223772807	3.92343	1.35871	0.90014
CV	14.01031207	27.2783	13.8095	12.7625

The above table demonstrate that the inventory turnover ratio of the Ambuja Cement was highest 28.65 in the year 2017 and was lowest 17.67 in the year 2012. The inventory turnover ratio of Ultratech in the year 2021 was

18.3 which was highest during the study period. After that it went on declining and was lowest 5.9 in the year 2009. The inventory turnover ratio of Tata Cement in the year 2015 was 12.91 which was highest during the study period and was lowest 8.23 in the year 2018. The inventory turnover ratio of JK Cement in the year 2021 was 8.31 which was highest during the study period and was lowest 5.89 in the year 2013. The average inventory turnover ratio of Ambuja Cement, Ultratech, Tata cement and JK during the study period was 23.01, 14.83, 9.83 and 7.05 respectively and the Coefficient of Variation

was 14.01, 27.27, 13.80 and 12.76 respectively. Higher the inventory turnover ratio better are result. Hence we can conclude that Ambuja Cement has higher average inventory turnover ratio than Ultratech, Tata cement, and JK.

We used one way ANOVA test for proofing hypothesis. This is the technique that can be used to compare means of two or more samples. This statistical tool can be used only for numerical data.

Null Hypothesis: There is no significant difference in inventory turnover ratio of cement companies.

Table 2: Summary of ANOVA results for Inventory Turnover Ratio

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F	P-VALUE	F CRITICAL VALUE
BETWEEN GROUPS	1461.662	3	487.2207	68.52041	5.95E-15	2.866265557
WITHIN GROUPS	255.9813	36	7.110592			
TOTAL	1717.643	39				

Since F calculated Value is greater than F critical value thus, null hypothesis is rejected and hence it can be concluded that Inventory Turnover ratio does differ significantly.

Table 3: Debtors Turnover Ratio

Years	Ambuja Cement	Ultratech	Tata	JK
2012	32.34	18.46	22.34	10.69
2013	34.56	16.31	23	9.87
2014	35.32	15.76	56	10.7
2015	38.23	19.61	20.45	9.94
2016	35.5	19.27	19.78	10.86
2017	30.31	17.17	22.6	10.94
2018	40.24	15.37	31.14	14.43
2019	48.11	16.13	31.58	20.95
2020	53.97	12.87	15.93	20.27
2021	59.95	11.89	12.01	22.54
TOTAL	408.53	162.84	254.83	141.19
MEAN	40.853	16.284	25.483	14.119
S.D	9.8835869	2.529721987	12.272166	5.1120782
CV	24.1930504	15.53501589	48.158248	36.207084

It can be observed from the above table that the Debtors turnover ratio of the Ambuja Cement was highest 59.95 in the year 2021 and was lowest 30.31 in the year 2017. The Debtors turnover ratio of Ultratech in the year 2015 was 19.61 which was highest during the study period. After that it went on declining and was lowest 11.89 in year 2021. The Debtors turnover ratio of Tata Cement in the year 2019 was 31.58 which was highest during the study period. After that it went on declining and was lowest 12.01 in the year 2021. The Debtors turnover ratio of JK Cement in the year 2021 was 22.54 which was highest during the study period and was lowest

9.87 in the year 2013. The average Debtors turnover ratio of Ambuja Cement, Ultratech, Tata cement and JK during the study period was 40.853, 16.284, 25.483 and 14.119 respectively and the Coefficient of Variation was 24.19, 15.53, 48.15 and 36.20 respectively. The standard Deviation of Ambuja Cement, Ultratech, Tata cement and JK during the study period was 9.88, 2.52, 12.27, and 5.11. Higher the Debtors turnover ratio better are result. Hence one can conclude that Ambuja Cement has higher average Debtors turnover ratio than Ultratech, Tata cement, and JK.

Table 4: Summary of ANOVA results for Debtors Turnover Ratio

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F	P-VALUE	F CRITICAL VALUE
BETWEEN GROUPS	4432.57	3	1477.52	21.0455	4.8E-08	2.86627

WITHIN GROUPS	2527.42	36	70.206			
TOTAL	6959.99	39				

Since F calculated Value is greater than F critical value thus, null hypothesis is rejected and hence it can be concluded that Debtors Turnover ratio does differ significantly.

Table 5: Working Capital Turnover Ratio

Years	Ambuja Cement	Ultratech	Tata	JK
2012	10.22	-182.87	-3.11	26.08
2013	-148.89	21.95	3.31	7.1
2014	6.53	-45.29	-5.83	7.9
2015	7.85	50.79	-6.38	6.8
2016	10.33	50.31	-4.04	8
2017	6.99	15.84	-2.81	11.7
2018	-77.75	33.27	-3.04	13
2019	17.67	22.54	-6.19	18.9
2020	-15.03	14.58	-4.93	12.4
2021	-10.38	15.82	-6.21	11.8
TOTAL	-192.46	-3.06	-39.23	123.68
MEAN	-19.246	-0.306	-3.923	12.368
S.D	53.24927171	69.45255	2.9072058	6.05210854
CV	-276.6770846	-22696.9	-74.1067	48.93360721

It can be observed from the above table that the Working capital turnover ratio of the Ambuja Cement was highest 17.67 in the year 2019 and was negative in the year 2013 which is -148.89. The Working capital turnover ratio of Ultratech was highest during the study period in the year 2015 was 50.79 and was -182.87 in year 2012. The Working capital turnover ratio of Tata was negative -6.38 in the year 2015. The Working capital turnover ratio of JK in the year 2012 was 26.08 which was highest during the study period. After that it went on declining and was lowest 6.8 in the year 2015. The

Total Working capital turnover ratio of Ambuja Cement, Ultratech, Tata cement and JK during the study period was 192.46, -3.06, -39.23 and 123.68 respectively and the Coefficient of Variation was -276.67, -22696.9, -74.10 and 48.93 respectively. The standard Deviation of Ambuja Cement, Ultratech, Tata cement and JK during the study period was 53.24, 69.45, 2.90 and 6.05. Higher the Working capital turnover ratio better are result. Negative working capital turnover ratio shows inefficiency of companies.

Table 6: Summary of ANOVA Results for Working Capital Turnover Ratio

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F	P-VALUE	F CRITICAL VALUE
BETWEEN GROUPS	5080.18	3	1693.39	0.8792	0.46097	2.86627
WITHIN GROUPS	69338	36	1926.06			
TOTAL	74418.2	39				

Since F calculated Value is less than F critical value thus, the null hypothesis is accepted and hence it can be concluded that working capital Turnover ratio does not differ significantly.

Table 7: Assets Turnover Ratio

Years	Ambuja Cement	Ultratech	Tata	JK
2012	1.589	1.067	1.29	0.82
2013	1.946	1.217	1.24	0.73
2014	2.1	1.308	1.43	0.77
2015	2.29	2.28	1.66	0.68
2016	2.36	2.43	1.4	0.78
2017	2.05	2.11	1.02	0.81
2018	2.15	1.84	1.06	0.78
2019	2.14	1.77	1.18	0.8
2020	2.03	1.74	1.14	0.75
2021	2.02	1.55	1.54	0.8
TOTAL	20.675	17.312	12.96	7.72

MEAN	2.0675	1.7312	1.296	0.772
S.D	0.20972853	0.455083338	0.2091358	0.042374
CV	10.1440642	26.28716139	16.137021	5.4888596

It can be observed from the above table that the Assets turnover ratio of the Ambuja Cement was highest 2.29 in the year 2015 and was lowest in the year 2012 which is 1.589. The Assets turnover ratio of Ultratech in the year 2016 was 2.43 highest during the study period. The Assets turnover ratio of Tata Cement was highest 1.66 in the year 2015 and was lowest 1.02 in the year 2017. The Assets turnover ratio of JK Cement in the year 2012 was 0.82 which was highest during the study period. After that it

went on declining and was lowest 0.68 in the year 2015. The Total Assets turnover ratio of Ambuja Cement, Ultratech, Tata cement and JK during the study period was 20.675, 17.312, 12.96 and 7.72 respectively and the Coefficient of Variation was 10.14,26.28,16.13 and 5.48 respectively. The standard Deviation of Ambuja Cement, Ultratech, Tata cement and JK during the study period was 0.20, 0.45, 0.20 and 0.04. Assets turnover ratio helps in measuring the efficiency of the company.

Table 8: Summary of ANOVA Results for Assets Turnover Ratio

SOURCE OF VARIATION	SUM OF SQUARE	DEGREE OF FREEDOM	MEAN SQUARE	F	P-VALUE	F CRITICAL VALUE
BETWEEN GROUPS	9.426675	3	3.142225	42.3737	6.7E-12	2.86627
WITHIN GROUPS	2.669582	36	0.074155			
TOTAL	12.09626	39				

Since F calculated Value is greater than F critical value thus, null hypothesis is rejected and hence it can be concluded that working capital Turnover ratio does differ significantly.

RESULTS FOR INVENTORY MANAGEMENT AND PROFITABILITY

Inventory management plays an important role in generating profitability of the company. Without proper inventory management we can't run our business successfully. Inventory management and profitability are interrelated each other. Investment in inventory is an important question, how much to invest in inventory? We have to keep inventory neither short nor excess. There are various tools and techniques have been developed to know the inventory level in our business namely EOQ model, ABC analysis, inventory turnover ratios, Just in time, Lead time, Determination of stocks level etc.

All these techniques help the company to keep inventory in sufficient way.

On the other hand, if we talk about the profitability concept, we know that every company's objective is to earn more and more profit. Profit helps the company to survive in competitive world and grow itself. Without profit no company will survive. According to Hermanson, "profitability is the relationship of income to some balance sheet measure which indicates the relative ability to earn income on assets employed" (Hermanson, 1983). Inventory Turnover and Profitability ratios have been calculated in order to identify the relationship between Inventory management and Profitability of cement industry in Gujarat.

Table 9: Summary of Inventory Turnover Ratio and Profitability Ratios of Ambuja Cement

Years	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
2012	17.67	5.77	9.53	5.87
2013	22.46	9.93	13.04	8.51
2014	21.62	7.16	9.93	6.24
2015	21.79	3.86	7.06	4.59
2016	26.43	5.43	9.7	5.48
2017	28.65	6.89	11.66	6.36
2018	21.08	8.49	13.43	7.42
2019	20.77	10.53	15.44	9.32
2020	23.69	11.39	15.21	10.8
2021	25.94	11.66	15.12	9.68

Table 10: Correlation Analysis of Ambuja Cement

	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
ITR	1			
GROSS PROFIT RATIO	0.107485271	1		
OPERATING PROFIT RATIO	0.150211112	0.962378918	1	
NET PROFIT RATIO	0.080847935	0.978944809	0.94716916	1

The correlation between Inventory Turnover Ratio and Gross Profit Ratio is 0.107. There is optimistic association between Inventory Turnover Ratio and Gross profit Ratio. The association between Inventory Turnover Ratio and Operating Profit Ratio is 0.150. There is also an optimistic association between Inventory Turnover Ratio and Operating

profit Ratio. The correlation between Inventory Turnover Ratio and Net Profit Ratio is 0.080. There is also a positive correlation between Inventory Turnover Ratio and Net profit Ratio. Hypothesis Justification: There is a positive or optimistic relationship between inventory management and profitability.

Table 10: Summary of Inventory Turnover Ratio and Profitability Ratios of Ultratech Cement

Years	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
2012	5.9	7.59	9.819	6.39
2013	11.25	14.29	16.292	11.27
2014	11.28	12.96	16.072	11.34
2015	13.51	10.02	11.837	9.03
2016	17.94	9.88	11.644	8.29
2017	15.38	9.52	11.654	9.27
2018	16.87	8.21	10.716	8.52
2019	16.22	8.68	11.302	7.83
2020	17.18	6.78	10.248	8.27
2021	18.3	9.74	12.784	8.94

Table 11: Correlation Analysis of Ultratech Cement

	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
ITR	1			
GROSS PROFIT RATIO	-0.245176534	1		
OPERATING PROFIT RATIO	-0.193841434	0.967464382	1	
NET PROFIT RATIO	-0.00255279	0.884648127	0.927903833	1

The correlation between Inventory Turnover Ratio and Gross Profit Ratio is -.245. There is negative correlation between Inventory Turnover Ratio and Gross profit Ratio. This is against the favorable result. The correlation between Inventory Turnover Ratio and Operating Profit Ratio is -0.193. There is also a negative correlation between Inventory Turnover Ratio and Operating profit Ratio. This is

also against the favorable result. The correlation between Inventory Turnover Ratio and Net Profit Ratio is -0.002. There is strong negative correlation between Inventory Turnover Ratio and Net profit Ratio. Hypothesis Justification: There is a negative relationship between inventory management and profitability.

Table 12: Summary of Inventory Turnover Ratio and Profitability Ratios of Tata Chemicals Ltd.

Years	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
2012	8.68	3.3	6.714	3.9
2013	10.22	8.47	11.4	6.33
2014	10.02	7.01	9.907	3.84
2015	12.91	4.73	7.692	2.28
2016	11.07	-0.24	3.816	0.67
2017	9.78	-8.69	-2.657	0.97
2018	8.23	-10.58	-3.409	-13.05
2019	9.26	1.44	6.877	-0.14
2020	8.83	-3.21	3.634	-5.48
2021	9.39	0.35	5.623	-1.75

Table 13: Correlation Analysis of Tata Chemicals

	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
ITR	1			
GROSS PROFIT RATIO	0.452596605	1		
OPERATING PROFIT RATIO	0.373340718	0.98764959	1	
NET PROFIT RATIO	0.495311803	0.798851001	0.738903058	1

The correlation between Inventory Turnover Ratio and Gross Profit Ratio is 0.452. There is a positive correlation between Inventory Turnover Ratio and Gross profit Ratio. This is favourable result. The correlation between Inventory Turnover Ratio and Operating Profit Ratio is 0.373. There is also a positive correlation between Inventory Turnover Ratio and Operating profit Ratio. This is also

favourable result. The correlation between Inventory Turnover Ratio and Net Profit Ratio is 0.495. There is also a positive correlation between Inventory Turnover Ratio and Net profit Ratio. This is also favourable result. Hypothesis Justification: There is a positive relationship between inventory management and profitability.

Table 14: Summary of Inventory Turnover Ratio and Profitability Ratios of JK Cement

Years	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
2012	6.08	25.9	8.342	1.37
2013	5.89	25.2	13.654	3.13
2014	7.08	27.3	11.345	5.98
2015	6.12	25.5	7.432	2.66
2016	6.53	25.6	9.143	3.72
2017	6.96	26	5.654	4.85
2018	7.38	22.5	4.324	3.82
2019	8.06	22.4	14.564	2.36
2020	8.12	22.4	15.35	4.4
2021	8.31	21.9	10.432	6.9

Table 15: Correlation Analysis of JK Cement

	Inventory Turnover Ratio	Gross Profit Ratio	Operating Profit Ratio	Net Profit Ratio
ITR	1			
GROSS PROFIT RATIO	-0.760177937	1		
OPERATING PROFIT RATIO	0.318043242	-0.252613891	1	
NET PROFIT RATIO	0.536471021	-0.125960705	0.01379495	1

The correlation between Inventory Turnover Ratio and Gross Profit Ratio is -0.760. There is a negative correlation between Inventory Turnover Ratio and Gross profit Ratio. This is against the favourable result. The correlation between Inventory Turnover Ratio and Operating Profit Ratio is 0.318. There is positive correlation between Inventory Turnover Ratio and Operating profit Ratio. This is favourable result. The correlation between Inventory Turnover Ratio and Net Profit Ratio is 0.536. There is also a positive correlation between Inventory Turnover Ratio and Net profit Ratio. This is also favourable result. Hypothesis Justification: There is almost positive relationship between inventory management and profitability.

LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

In this current study researcher tried to cover many things but it is not possible to cover all the things many things or research point still left due to many reasons. As we know research means search, search and research, it means search again and again. Is there any part left which need to be search. Future scope of the study may cover the following points. The present study was conducted for only four cement companies for a period of ten years. There may be significant scope for further studies considering a greater number of years and including more companies in the sample. The study can also be extended to other similar companies and the results can be compared to see the difference.

Every segment in the cement manufacturing companies should be studied at the micro or deep level for efficient working capital management. Researcher can also add more profitability ratios. The scope for further research may be extended to working capital management components including cash, marketable securities etc. The outcomes of this study may help similar nature companies in keeping efficient working capital, inventory, and reduction in operating cycle period or cash conversion cycle.

CONCLUSION

In order to analyze first objective, the working capital management efficiency of cement companies in Gujarat, we calculated the following ratios inventory turnover ratios, debtor's turnover ratios, working capital turnover ratios, and assets turnover ratios. One way ANOVA test is used to test the various hypotheses. The entire null hypotheses are rejected except working capital turnover ratio. In the second objective to know the relationship between inventory management and profitability of cement companies, we calculated the inventory turnover ratio, operating profit ratio, net profit ratio, and gross profit ratio. Ambuja cement has a positive correlation of inventory turnover ratio in relation to gross profit ratio, operating profit ratio and net profit ratio. Ultratech has a negative correlation of inventory turnover ratio in relation to gross profit ratio, operating profit ratio and net profit ratio. Tata chemicals has a positive correlation of inventory turnover ratio in relation to gross profit ratio, operating profit ratio and net profit ratio. JK cement has a negative correlation between inventory turnover ratio and gross profit ratio and has positive correlation remaining the ratios i.e operating profit ratio and net profit ratio.

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