

Investigate Factors affecting on the Performance of Cement Industry based on Copeland Method

Vahide Hajihassani*

Young Researchers and Elite Club, Abhar Branch, Islamic Azad University, Abhar, Iran; v.hajihassani@yahoo.com

Abstract

A compensatory Multi-criteria decision making methods is called Copeland method. Criteria are liquidity, profitability, activity, financial leverage and growth. Aim of this research is the study of factors affecting on the performance of Cement industry based on Copeland method. Presented this research for all 28 Cement Companies that accepted in Stock Exchange of Tehran since (1379-1388) and sample is equals with society. Research method is descriptive and based on the target is application. According to the results, we see that A_{23} = Azar Shahr and Ardabil lime Cement industry is the best company and A_{16} = Dorood Cement company has the last rank. So we see that the research question is answered and each company a ranking is awarded based on financial ratios. So the growth, profitability, liquidity, financial leverage, activity have an impact on the performance of Cement companies. We from research conclude that based on implemented ranking, Azar Shahr and Ardabil lime Cement industry has the first rank.

Keywords: Activity, Copeland Method, Financial Leverage, Growth, Liquidity, Profitability

1. Introduction

In analyzing companies, it is often important to measure their performance relative to other companies in the industry. Designing method for long and short term planning in every organization will start by evaluating the all condition. By indicative the present condition of company between other companies, and by making a competitive space in the financial evaluating model, companies bring up to achieve a best state. This matter equipped needed tools for companies to access the information in all industry. Standards of industry can be growth by believing in ability of human. We can use two types of MCDM methods, compensatory and non-compensatory¹. The permit tradeoffs between attributes are called compensatory methods. A small decrease in one attribute is acceptable if it is compensated by increasing in one or more other properties. Compensatory methods can be classified into the following four subgroups:

1. Scoring,
2. Compromising,
3. Concordance,
4. Evidential Reasoning (ER) approach methods².

But on the real world, the decision makers do not limit yourself to one method and it is possible to use different methods to achieve different results. In this context, techniques have been suggested for combining ranking techniques that include Average Ranking, Borda, and Copeland methods³.

Research by Research by Rangriz and et al.⁴ investigate of Iran Cement companies based on AHP and TOPSIS methods. Goal of this research ranking cement companies by multi criteria decision making methods. Hajihassani indicated the relationship between Working Capital Management and profitability Iran Cement Industry⁵. In this research, we want to achieve whether financial ratios affect the efficiency of the companies in the cement in companies in Iran. In 28 cement companies, we study the relationship between working capital management and profitability i by using their data companies are empirically examined. The secondary data of this study is collected the financial reports of Tehran stock exchange for the period of six years from 2004 until 2009. Also, we used these methods, correlation coefficient and multiple regression analysis, to analyze the data. In the range of

*Author for correspondence

0.01 and 0.05 level of significance findings were tested. After study the test result, we achieved that the return on investment is weak negatively correlated according to the CR, ITR. Also, ROI is very weak positively correlated with the LR and CTR. The results of other researchers show that the LR and CTR have a positive relation with ROI. This means that, LR and CTR both have a negative impact on ROI. So, CR relationship is little with ROI, the relationship is not decisive. Here is substantial decrease in the value of the R-squared that it shows the importance of ITR in the model. The result showed that there is a weak relationship between working capital management and profitability in the specific context of cement industry in Iran. Hajihassani showed investigate of financial performance of Iran cement industry. This research concludes that the profitability ratio of companies is different than liquidity, leverage financial ratios⁶.

2. Materials and Method

The secondary data that collected from financial reports which is accepted in Tehran stock exchange for the period of one year from 2000–2009 is used in this research. This research did by using data of 28 accepted in Tehran stock exchange Cement companies and the size sample is equal to the size society. The research method is descriptive and application. In this research used Copeland method for performance evaluation.

2.1 Copeland Method

To implement this technique, a non-diagonal matrix $m \times m$ formed that description row i of columns j ($i \neq j$) can be specified number of wins. If more wins technique, we encode it with M and it is preferable rows into columns. If the columns was superior to the row or if the number of wins was equal then we encode with X. Copeland method not only the number of wins but it calculates the number of losses. Specified that M on the row i is win and in the column j is loss. In this method, the ranking is based on the numbers M in row i and column j ($i \neq j$). That means subtracting wins to losses is based on ranking³.

2.2 Financial Ratios

Financial ratios are useful indicators for the performance and financial position of the company. Financial ratios ranking according to Information provided⁷. In this research, we will discuss five main criteria of the financial

ratios with fourteen sub criteria that they are growth ratio with sub criteria sales growth, operating profit growth, shareholders equity, assets growth; profitability ratio with sub criteria net profit margin, return on assets; liquidity ratio with sub criteria current, quick, cash; activity ratio with sub criteria total asset turnover, working capital turnover; leverage financial ratio with sub criteria debt, long term debt to shareholder's equity, fixed assets to shareholder's.

2.3 Liquidity Ratios

Liquidity ratios measure the company's ability in preparing the sufficient cash for business leadership in the following months⁸. In other words, liquidity ratios measures the company's power and ability in refund short-term debts. Ratios that measure the company's liquidity are current, quick, cash ratios⁷.

$$CR = \frac{\text{Current Assets}}{\text{Current Liabilities}}; CR = \text{current ratio} \quad (1)$$

$$\text{Quick Ratio} = \frac{(\text{Current Assets} - \text{Inventories})}{\text{Current Liabilities}} \quad (2)$$

$$\text{Cash Ratio} = \frac{(\text{Cash} + \text{Marketable Securities})}{\text{Current Liabilities}} \quad (3)$$

2.4 Profitability Ratios

Profitability ratios used to measure of the income adequacy. Profitability ratios used to operational activities evaluation of companies⁹. Anyone whose economic interests are tied to the long term survival of a company will be interested in it⁸. Ratios that measure the company's profitability are:

$$\text{Net Profit Margin Ratio} = \frac{\text{Earning after taxes}}{\text{Sales}} \quad (4)$$

$$\text{Return on Assets Ratio} = \left(\frac{\text{Net Profit}}{\text{Assets}} \right) * 100 \quad (5)$$

2.5 Activity Ratios

Activity ratios used to operation period evaluation and composition of current assets of companies. Composition of current assets refers to what amount of current assets of the company is converted rapidly to the cash. Ratios that measure the company's activity are:

$$\text{Total Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Total Assets}} \quad (6)$$

$$\text{Working Capital Turnover} = \frac{\text{Net sales}}{\text{working capital}} \quad (7)$$

2.6 Leverage Financial Ratios

Ratios are that evaluating the relationship financial resources of the company accounting to current debts, long term debts, shareholder's equity and how to combine them. Leverage financial ratios compare cash that provided to investment from the creditors and ratios measures them. Ratios that measure the company's leverage financial are:

$$\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}} \quad (8)$$

$$\begin{aligned} &\text{Long-term Debt to Shareholder's Equity Ratio} \\ &= \frac{\text{Long-term Debt}}{\text{Shareholder's Equity}} \end{aligned} \quad (9)$$

$$\begin{aligned} &\text{Fixed Assets to Shareholder's Equity Ratio} \\ &= \frac{\text{Fixed Assets}}{\text{Shareholder's Equity}} \end{aligned} \quad (10)$$

2.7 Growth Ratios

Growth ratios indicate how well the position of the company in the industry. Ratios that measure the company's growth are:

$$\text{Sales Growth} = \frac{(St - St-1)}{[St-1]} * 100 \quad (11)$$

Here, St = Net sales of the current period, $St-1$ = Net sales of the previous period

$$\text{Operating Profit Growth} = \frac{(Pt - Pt-1)}{[Pt-1]} * 100 \quad (12)$$

Here, Pt = Operating profit with current prices, $Pt-1$ = Operating profit of the previous period

$$\text{Shareholders Equity Growth} = \frac{(Et - Et-1)}{[Et-1]} * 100 \quad (13)$$

Here, Et = Shareholders Equity of the current period, $Et-1$ = Shareholders Equity of the previous period

$$\text{Assets Growth} = \frac{(At - At-1)}{[At-1]} * 100 \quad (14)$$

Here, At = Assets of the current period, $At-1$ = Assets of the previous period¹⁰.

2.8 Research Question

Have the growth, profitability, liquidity, financial leverage, activity an impact on the performance of Cement companies?

3. Result

We calculated financial ratios and writing results in the Table 1 and used from Copeland method for ranking Cement companies. Tables 2 is indicated results ranking.

(wins – losses) = (15, -12, 2, -1, 4, 18, -4, 14, -8, 4, -13, 9, -17, 10, -14, -25, 15, 8, -22, -14, -12, 22, 25, -5, -19, 20, 6, -4)

$$\begin{aligned} &= A_{23} \gg A_{22} \gg A_{26} \gg A_6 \gg A_1, A_{17} \gg A_8 \gg A_{14} \gg A_{12} \\ &\gg A_{18} \gg A_{27} \gg A_5, A_{10} \gg A_3 \gg A_4 \gg A_7, A_{28} \gg A_{24} \\ &\gg A_9 \gg A_2, A_{21} \gg A_{11} \gg A_{15}, A_{20} \gg A_{13} \gg A_{25} \gg \\ &A_{19} \gg A_{16} \end{aligned}$$

According to the results of Table 2, we see that A_{23} = Ardabil and Azar Shahr lime Cement company obtained the best rank and A_{16} = Dorood Cement company is worst. So we see that the research question is answered

Table 1. Financial ratios

company	Liquidity	Profitability	Activity	Financial leverage	Growth
A_1 Orumie	0.65	0.42	-0.87	0.71	0.34
A_2 Tehran	0.38	0.36	-0.99	0.64	0.30
A_3 Khazar	0.42	0.20	0.86	1.49	0.50
A_4 Sepahan	0.57	0.40	-2.57	0.60	0.32
A_5 Shuhrood	0.25	0.33	0.73	1.90	0.40
A_6 Shomal	0.50	0.55	-1.93	0.66	0.55
A_7 Soofian	0.49	0.41	0.49	0.57	0.31
A_8 Shargh	0.54	0.31	4.10	0.65	0.44
A_9 Gharb	0.47	0.29	-5.43	0.95	0.55
A_{10} Fars and khoozestan	0.55	0.52	0.23	0.36	0.41
A_{11} Ghuen	1.16	0.49	-2.02	0.39	0.22
A_{12} Muzandarun	0.41	0.35	1.48	1.12	0.43
A_{13} Kermun	0.53	0.38	-2.32	0.43	0.28
A_{14} Kordestun	1.25	0.34	1.98	0.35	0.37
A_{15} Kuroon	0.42	0.35	1.48	0.46	0.26
A_{16} Dorood	0.42	0.25	-1.54	0.92	0.20
A_{17} Dashtestan	1	0.38	2.26	0.68	0.17
A_{18} Ilum	0.54	0.26	6.30	1.18	0.32
A_{19} Sefid Neyriz	1	0.27	0.02	0.42	0.22
A_{20} Fars	0.28	0.29	-0.48	0.90	0.32

(Continued)

Table 1. Continued

	company	Liquidity	Profitability	Activity	Financial leverage	Growth
A ₂₁	Durub	0.47	0.26	4.05	0.65	0.22
A ₂₂	Esfahan	0.98	0.40	5.61	0.54	0.33
A ₂₃	Ardabil and Ahak Azar shahr	0.88	0.40	8.62	0.40	0.35
A ₂₄	Bojnoord	0.38	0.28	-1.74	1.33	0.35
A ₂₅	Hegmatan	0.31	0.27	-2.07	1.28	0.33
A ₂₆	Hormozgan	0.61	0.37	2.40	0.69	0.26
A ₂₇	Behbahun	0.56	0.33	2.44	0.55	0.34
A ₂₈	Khush	0.65	0.30	1.98	0.57	0.28

Table 2. Ranking cement companies

company	Sum wins
A ₁	21
A ₂	7
A ₃	15
A ₄	12
A ₅	16
A ₆	23
A ₇	11
A ₈	20
A ₉	10
A ₁₀	14
A ₁₁	6
A ₁₂	18
A ₁₃	5
A ₁₄	19
A ₁₅	7
A ₁₆	0
A ₁₇	22
A ₁₈	17
A ₁₉	1
A ₂₀	6
A ₂₁	8
A ₂₂	25
A ₂₃	26
A ₂₄	12
A ₂₅	2
A ₂₆	24
A ₂₇	16
A ₂₈	10

and each company investigated based on financial ratios. So the growth, profitability, liquidity, financial leverage, activity are effective on the performance of Cement companies.

4. Discussion and Conclusion

We from research conclude that, Ardabil and Azar Shahr lime Cement Company earned the first rank. So the growth, profitability, liquidity, financial leverage, activity are effective on the performance of Cement companies also used Copeland method very much. The results of this study are consistent with previous research and also Ardabil and Azar Shahr lime Cement company obtained the first rank. This research suggested that in future studies use other techniques such as Taxonomy, VIKOR and compare with its research.

5. References

1. Hwang CL, Yoon K. Multiple attribute decision making methods and applications. Springer-Verlag; 1981.
2. Xu L, Yang J-B. Introduction to multi-criteria decision making and the evidential reasoning approach. University of Manchester Institute of Science and Technology; 2001.
3. Azar A, Rajabzade A. Using taxonomy in priority setting. Applied Decision Making MADM approach, Negahe Danesh; 2012.
4. Rangriz H, Jalilee M, Hajihassani V. Performance evaluation of Iran cement companies based on AHP and TOPSIS methods. Technical Journal of Engineering and Applied Sciences. 2012; 2(9):285–92.
5. Hajihassani V. The relationship between working capital management and profitability: a case study of cement industry in Iran. Journal of Basic and Applied Scientific Research. 2013; 3(3):57–61.
6. Hajihassani V. A comparison of financial performance in cement sector in Iran. Inventi Journals: Microfinance & Banking. 2012; Issue 4.
7. Esmailpour M. Investment guide in the stock exchange: financial statement analysis. Commercial publishing; 2004.
8. Moyer RC, Guigan JR, Kretlow WJ. Contemporary financial management. USA: West publishing company; 1992.
9. Akbari F. Financial Statement Analysis. Audit Organization; 2010.
10. Ertugrul I, Karakasoglu N. Performance evaluation of Turkish cement firms with fuzzy analytic hierarchy process and TOPSIS methods. Expert Syst Appl. 2009; 36:702–15.