The Relationship between Operating Cash Flow and Income Smoothing in Healthy Companies Compared with Companies Going Bankrupt and the Bankruptcy Doubt that the Model of Altman

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ABSTRACT

Investors, credit providers and financial analysts interested in more information about smoothing in the investee company to have, especially if this information is based on decisions affecting them. Research findings indicate that many investors in making investments, profit smoothly and prefer low volatility. In this context, managers are trying to profit and growth rates show it smoothly. This study examines the effect of operating cash flow in public listed companies (Salem, bankrupt and uncertainty in the region, according to Altman bankruptcy model) on the Stock Exchange on earnings smoothing. Lintner model used to smooth income. A careful study of literature, three hypotheses and sample consists of 164 companies for the period 1389-1393 five-year and using multiple linear regression analysis is located. The results indicate that a significant positive relationship between income and income smoothing exists. But between operating cash flow and income smoothing significant positive relationship was not found. As well as between income compared with the previous year and operating cash flow smoothing and there is a significant positive relationship.

KEYWORDS
Operating Cash Flow, Income Smoothing, Companies Going Bankrupt, Model of Altman

INTRODUCTION

Profit from the superior performance of a single economic parameters and financial decision-making as one of the criteria of credibility is particularly important. In this regard, any stream that profits will be changed in a way become a prominent issue. The potential benefit of income smoothing can be effective in user behavior and consequences result. In theory it away with poor performance of capital markets and efficacy may be more important.

Investors believe that fixed income compared with a profit fluctuations, higher dividend payment guarantees. As well as fluctuations in earnings as an important measure of risk is perceived and the company's overall profit companies are smoother, with less risk. So the companies that are paved with profits, investors were most interested in the location they are more suitable for investment.

Users of accounting information based on the information reported in the financial statements to evaluate the profitability and for predicting future cash flows of the company and establishes a logical connection between the then the profitability and value of future cash flows of the company and evaluations based on these predictions to decide.

Site motivation of earnings management, obtain the appropriate position among competitors and increasing shareholder value in the capital market, which makes investors and creditors of the company have more favorable terms. So the main issue in the present study was to investigate the relationship between earnings and operating cash flow smoothly in Tehran Stock Exchange experimental test be given and answer the following questions:

1. The relationship between income and smoothing in Tehran Stock Exchange today?
2. The relationship between operating cash flow and income smoothing in Tehran Stock Exchange today?

HISTORY RESEARCH

Lind Chen (2009) in his article titled "income smoothing, unreliable information, stock returns and the cost of shareholders' income smoothing effect on unreliable information, stock returns and the cost of shareholders to be evaluated. He shows, smoothing uncertain information and reduce the cost of shareholders. With his shock of
unexpected profits control and other corporate profile, this is the result of the hand finds that profit-making companies that smoothly doing at the time of the notification date close to profit is considerably higher for non-normal yields. Zhong et al (2007) The relationship between major shareholders and smoothing the companies listed on the New York Stock Exchange investigated. The results showed there were major shareholders (the company that has managed to face declining profits) directly associated with discretionary accruals.

Ha And colleagues (2002) examined the informational content of operating cash flow, earnings and accruals in China's capital market. The results indicate the content is more profitable than operating cash flow. Also in this study, increasing the information content of discretionary accruals versus non-discretionary accruals was confirmed.

Raymond Smith in 1930 and 1935 arto vinkoro his studies entitled "Methods of analysis of financial ratios of bankrupt companies" for the University of Illinois. They found that the most accurate scale for determining the status of bankruptcy, is the ratio of working capital to total assets. It seems that the first detailed studies to predict corporate bankruptcy by the financial ratio analysis done in 1932 is Paul Fitzpatrick. In their study, entitled "Signs of bankruptcy industry," the 13-year-old over a period of 13 to 20 used the now-bankrupt Successful and Unsuccessful. He came to the conclusion that all financial ratios to predict bankruptcy somewhat, but the proportion of net profit to equity, equity to debt and equity to fixed assets, are the best ratios to predict bankruptcy (Pompey did manage Pauli, 2002).

"The relationship between income smoothing and size of the company and the types of companies listed on the Tehran Stock Exchange" is another title in 1386 by Mahnaz mollanazari and Sanaz karimizand he was done. They proved, the size of the company (sales) and there is a strong correlation between income smoothing and this relationship is reversed. But significant differences between the types of smoothers companies there.

Mashayekhi and Safari (1385) examined the cash from operations and earnings management in listed companies in Tehran's Stock Exchange. The results showed that when cash from operating activities is weak, companies tend to adopt strategies to increase profits. It was also observed that some companies with high operating activities also tend to have lower profit policies.

Mehdi Faghnani narm (1381) in their study the relationship between financial ratios and predicted the bankruptcy of companies listed on the Tehran Stock Exchange during the years 1369 to 1378, according to Altman's model is studied and came to the conclusion that between ratios used in bankruptcy prediction model Altman and there is a significant relationship.

RESEARCH METHOD

In terms of classification based on the purpose of this research study is an applied research. Applied research aimed at the development of practical knowledge in a particular field. In other words, the practical application of knowledge-driven applied research. The method of this study is classified according to the type of descriptive research includes a set of methods that aim to describe the conditions or phenomena is investigated. The descriptive analysis of the survey after the event.

Data collection methods can be classified in two categories: methods of library and field methods. In this study, part of which is mainly used to review and theoretical research, the library method has been collected. For this purpose, domestic and foreign articles to read books and articles and literature and review of literature was used. Another part of the required information associated with variables research hypotheses are raised in the field method is the use of the CD and the software has been extracted. Source used to gather the required data, the company's financial statements. The information in this section can be downloaded from the following sites are available on the Company's financial statements and is used under the Securities Exchange: WWW.BOURS.IR, WWW.CODAL.IR. Data collected through software, Excel reform and classification and final analysis of the software Eviews and Spss done.

THE COMMUNITY AND STATISTICAL SAMPLE

The study population consisted of listed companies in Tehran Stock Exchange that the company has all of the following conditions:

1. The financial data for the years 1389 to 1393 study period is available.
2. the fiscal year that ended in March.
3. companies that are listed on the Stock Exchange up to date 01.01.1389 and the name of the company in the period under review of the companies listed on the Tehran Stock Exchange has been removed.
4. Financial terms have not changed in the period under review.

After applying the restrictions, the 164 companies in the period 1389 to 1393 of the above conditions and according to this sampling and all companies chosen for study were not doing. Then, according to Altman bankruptcy model healthy companies into three categories, bankrupt and regional hesitate to Table 1 groups.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Company type</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td>Healthy</td>
</tr>
<tr>
<td>23</td>
<td>Region doubt</td>
</tr>
<tr>
<td>3</td>
<td>Bankrupt</td>
</tr>
<tr>
<td>164</td>
<td>The total sample companies</td>
</tr>
</tbody>
</table>

RESEARCH HYPOTHESIS

The first hypothesis: between income and profit-making companies pave the positive relationship healthy and strong than the bankrupt enterprises and the area of doubt using Altman.
The second hypothesis: between operating cash flow and a strong positive relationship between income smoothing than in healthy companies bankrupt and regional companies using Altman’s model is doubtful.

The second hypothesis: income compared to operating cash flow and a stronger positive relationship with income smoothing healthy companies to go bankrupt and regional companies using Altman’s model is doubtful.

RESEARCH MODEL AND ITS VARIABLES

The relationship between operating cash flow and income smoothing, using regression analysis as follows investigated. To test the research hypotheses, regression model was used:

1. To test the first hypothesis of the model:

\[ \log D_{it} = \beta_0 + \beta_1 \log D_{it-1} + \beta_2 \log E_{it} + \beta_3 \log E_{it-1} + \varepsilon_{it} \]

To test the second hypothesis of the model:

\[ \log D_{it} = \beta_0 + \beta_1 \log D_{it-1} + \beta_2 \log \text{CFO}_{it} + \beta_3 \log \text{CFO}_{it-1} + \varepsilon_{it} \]

2. To test the third hypothesis of the model:

\[ \log D_{it} = \beta_0 + \beta_1 \log D_{it-1} + \beta_2 \log E_{it} + \beta_3 \log \text{CFO}_{it-1} + \varepsilon_{it} \]

In the model;

The dependent variable of the study is to assess the level of dividends smoothing Lintner model used is as follows:

Lintner (1956) in their study found that corporate executives believe that shareholders want dividends are constant stream without fluctuation. As a result, companies tend to have their dividends annually slight changes in relation to the sharp change in their dividend. How to measure the speed of reform dividends in this model (SOA) is called, using the model (2) is measured:

\[ \Delta D_{it} = \alpha + \beta_1 D_{i,t-1} + \beta_2 E_{it} + \varepsilon_{it} \]  

model (2)

where in:

\[ \Delta D_{it} \]: The change in dividends compared to the previous period (previous year)  
\[ D_{i,t-1} \]: The previous year’s dividend  
\[ E_{it} \]: Net profit per share  

The dividends model (SOA) based on an estimated negative beta coefficient (1β-) will be considered. The value obtained is greater, smoothing represent less.  

Independent variables included: income and operating cash flow is.

\[ E : \text{Income or earnings per share} \]
\[ \text{EPS} = \frac{N_1}{N} \]
\[ E_{i,t-1} : \text{Income or earnings per share the previous year} \]
\[ \text{CFO} : \text{Cash flow from operating activities} \]
\[ \text{CFO} = N_1 + \text{NCC} + \Delta WC \]
\[ \text{NCC} : \text{Non-cash expenses that should be added to the net profit. Because these types of costs have been reduced net profit but not to reap the outside. Such as depreciation} \]
\[ \text{CFO}_{i,t-1} : \text{Operating cash flow last year} \]

STATISTICAL TESTS

Multivariate regression:

The starting point for research econometric regression model in which a causal relationship between the dependent variable and the independent variable is assumed. Changes in the regression model, the dependent variable (y) by changes in the independent variables, explains. Causal relationship between the dependent variable and independent variables (x1, x2, ..., xn) can adopt any of the forms of implicit functions.

Partial regression coefficients significance test (test t):

In order to test the partial regression coefficients of significant assumptions and t-test probability (p-value) is used. Hypothesis testing is as follows:

\[ H_0: \text{There was a significant relationship between independent variables and the dependent variable} \]
\[ H_1: \text{A significant relationship between independent variables and the dependent variable} \]

If the p-value is greater than the error level α (5 percent), the coefficient obtained is not significant and the null hypothesis can not be ruled out. Similarly, if the p-value is smaller than the error level, achieved significant factor and the null hypothesis is rejected.

Significant regression test (test F):

In multiple regression equation, if the relationship between the dependent variable and the independent variables are not independent variables in the equation have all coefficients equal to zero. With a multiple regression model, decision rule is as follows:

\[ H_0: \text{All regression model coefficients equal to zero.} \]
\[ H_1: \text{At least one of the coefficients of the regression model, is non-zero} \]

If the F statistic is calculated at 95 percent regression equation derived from the F Fisher is bigger than this table, the null hypothesis is rejected and otherwise null hypothesis will be accepted.

Test correlation errors (Durbin Watson):

For serial correlation in the error terms of the Durbin-Watson test was used. Durbin-Watson test is based on the model of the first order autocorrelated error. The test statistic value is in the range of 0 and 4. If the camera is Watson 2 shows that errors are independent of each other (no correlation). If this statistic is in the range of 5/1 to 5/2 test the null hypothesis (no correlation) will be accepted and otherwise null hypothesis is rejected.

\[ H_0: \text{There is no correlation between errors} \]
\[ H_1: \text{There is a correlation between errors} \]

The dependent variable normality test (Kolmogorov-Smirnov):

These tests verify the claims made about the distribution of a quantitative variable is used. The normality of the
dependent variable for regression analysis examined by our K-S. The assumption of zero in the number of tests being specified with the distribution of the theoretical views of the distribution (with a certain parameter) is different though it or guess, we have determined the appropriate opposite assumption, and is not intended for distribution.

H0: The data follow a normal distribution
H1: The data do not follow a normal distribution

How to judge the value of this test sig (Significance) is obtained. If this amount is less than 5 percent H0 rejected and the claim distribution of variable data will not be accepted.

Correlation between variables (Pearson correlation coefficient):

The coefficient of correlation between the two variables have a spacing amount or calculate the relative value between-1 and 1-if the value obtained is positive means that the two variables simultaneously for changes happening with the increase in any other variable, the variable also increases and vice versa if the amount were a negative factor means that two variables in order to act together with the photo increases the value of a variable values The other variable decreases and vice versa. If the value obtained was of zero indicates that no relationship between the two variables does not exist and if it was a perfect positive correlation and 1 if Complete and negative correlation was-1.

The coefficient of determination:

The coefficient of determination is the most important criterion by which the relationship between the two variables explained. Factor determining the rate variability (SD) is the dependent variable explained by the regression. The value of this ratio indicates what percentage of the dependent variable explained by the independent variables.

THE RESULTS OF TESTS RESEARCH

According to the hypothesis of the study was that the relationship between income and cash flow smoothly with operating profit-making companies, check the statistical community into two healthy companies and bankrupt companies and in the area of doubt and Division of each hypothesis in the aforementioned two categories (healthy and bankrupt) test.

The first hypothesis test results Healthy companies:

The first hypothesis test results in healthy companies in Table 2 below. As this table shows the probability of t-statistic variable earnings per share (0.000), the first hypothesis is confirmed at the level of 95%, ie between earnings per share and income smoothing in healthy companies there is a significant relationship. Also, among the variables dividend of the previous year and earnings per share the previous year at 95 percent positive and significant relationship with the dependent variable income smoothing. According to statistics probability F, total regression to the first hypothesis is significant at 95% confidence level. Durbin-Watson statistic also indicates the lack of correlation between variables. Thus, according to the results, it can be concluded that a stronger positive correlation between earnings per share and income smoothing in healthy companies there.

| Log $D_n = \beta_0 + \beta_1 \log D_{n-1} + \beta_2 \log E_{n} + \beta_3 \log E_{n-1} + \epsilon_n$ |
|---|---|---|---|
| The amount of t | The probability statistic t | Factor |
| 50/435 | 0/000 | 175 | Constant |
| 34/570 | 0/000 | 295 | $D_{n-1}$ |
| 106/530 | 0/000 | 873 | E |
| -18/237 | 0/000 | -146 | $E_{n-1}$ |
| 0/998 | The coefficient of determination |
| 0/995 | Adjusted coefficient of determination |
| 7787/29 | F statistic |
| 0/000 | The probability statistic F |
| 1/83 | Durbin-Watson statistic |

Log $D_n = 1/53 + 0/295 D_{n-1} + 0/873 E_n - 0/146 E_{n-1}$

Bankrupt companies and in doubt:

The first hypothesis and test results at the company bankrupt in doubt in Table 3 below. As this table shows the t-statistic considering the possibility of variable earnings per share (608/0), the first hypothesis can not be confirmed at a confidence level of 95%, ie between earnings per share and income smoothing in bankrupt companies and in there is no doubt significant area. Also, among the variables dividend of the previous year and earnings per share the previous year at 95 percent positive and significant relationship with the dependent variable income smoothing them. According to statistics probability F, total regression to the first hypothesis is not significant at the 95 percent confidence level. Durbin-Watson statistic also indicates the lack of correlation between variables. Thus, according to the results, it can be concluded that a stronger positive correlation between earnings per share and smoothing in the companies bankrupt and there is no doubt in the region.

| Log $D_n = \beta_0 + \beta_1 \log D_{n-1} + \beta_2 \log E_{n} + \beta_3 \log E_{n-1} + \epsilon_n$ |
|---|---|---|---|
| The amount of t | The probability statistic t | Factor |
| 18/11 | 0/000 | 5/663 | Constant |
| -0/094 | 0/926 | -0/015 | $D_{n-1}$ |
| 0/518 | 0/608 | 0/104 | E |
| 0/870 | 0/390 | 0/176 | $E_{n-1}$ |
Log $D = 5/663 - 0/015 D_{t-1} + 0/104 E_{t-1}$

The first hypothesis test result:

The first hypothesis test result in Table 4 below. Given the significant level of earnings per share variable in healthy companies (0.00) and positive beta coefficient (87/0) in healthy companies, the first hypothesis is confirmed at 95 percent, in other words, the earnings per share and smoothing in the company healthy and positive relationship stronger than the insolvent companies and the region is doubtful.

<table>
<thead>
<tr>
<th>Tab. 4. Results of the first hypothesis test</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bankrupt companies and in the area of doubt</td>
</tr>
<tr>
<td>0/608</td>
</tr>
<tr>
<td>0/10</td>
</tr>
<tr>
<td>×</td>
</tr>
</tbody>
</table>

The second hypothesis test results Healthy companies:

The second hypothesis test results in healthy companies in Table 5 below. As this table shows the probability of t-statistic Independent variable operating cash flow (03/0) at 95 percent positive and significant relationship with the dependent variable income smoothing is, in other words, the second hypothesis is confirmed at the level of 95% be. Also, among the variables, dividends last year, operating cash flow last year at 95 percent positive and significant relationship with the dependent variable income smoothing. According to the statistics probability F, total regression to the second hypothesis is confirmed at 95% confidence level. Durbin-Watson statistic also indicates the lack of correlation between variables. Thus, according to the results, we hypothesized that there is a significant relationship stronger between operating cash flow and income smoothing, in healthy companies is confirmed.

<table>
<thead>
<tr>
<th>Tab. 5. The second hypothesis test results in healthy companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log $D = \beta_0 + \beta_1D_{t-1} + \beta_2LogCFO_{t} + \beta_3LogCFO_{t-1} + \epsilon_t$</td>
</tr>
</tbody>
</table>

The second hypothesis test results Bankrupt companies and in doubt:

The second hypothesis test results in the bankrupt companies and in the area of doubt on the table (6) had been brought as this table shows operating cash flow independent variable in the 95% confidence level and a significant positive relationship with a dependent variable is not profit-making smoothly, nearly 95 percent of the second hypothesis at the level of certainty is not OK. According to the statistics probability F, total regression to the second hypothesis is not significant at 95% confidence level. Durbin-Watson statistic also indicates the lack of correlation between variables. Thus, according to the results, we hypothesized that there is a significant relationship stronger between operating cash flow and income smoothing, the company insolvent or uncertainty in the region can not be verified.

<table>
<thead>
<tr>
<th>Tab. 6. The second hypothesis test results at the company bankrupt and in doubt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log $D = 6/042 + 0/623 D_{t-1} - 0/027 CFO_{t-1}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The amount of t</th>
<th>The probability statistic t</th>
<th>Factor</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>28/588</td>
<td>0/000</td>
<td>6/112</td>
<td>Constant</td>
</tr>
<tr>
<td>0/290</td>
<td>0/774</td>
<td>0/046</td>
<td>$D_{t-1}$</td>
</tr>
<tr>
<td>-1/732</td>
<td>0/092</td>
<td>-0/882</td>
<td>CFO</td>
</tr>
<tr>
<td>1/579</td>
<td>0/123</td>
<td>0/804</td>
<td>CFO_{t-1}</td>
</tr>
<tr>
<td>0/280</td>
<td>The coefficient of determination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0/004</td>
<td>Adjusted coefficient of determination</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The second hypothesis test result:

The second hypothesis test results in Table 7 below. Given the significant level of variable operating cash flow in healthy companies (03/0) and negative beta coefficient (027 / 0 - ) second hypothesis cannot be confirmed at 95 percent. In other words, between operating cash flow and a strong positive relationship between income smoothing in healthy companies than the companies bankrupt and there is no doubt.

The third hypothesis test results Healthy companies:

The third hypothesis test results in healthy companies in the table (8) is given. As this table shows the t-statistic considering the possibility of variable income (03/0) in operating cash flow compared with the previous year (03/0), fourth hypothesis is significant at 95% confidence level. In other words, the income compared to operating cash flow and income smoothing There is a significant relationship stronger in healthy companies. F is also the possibility of meaningful statistics relating to the regression model predicted at 95 percent. Durbin-Watson statistic also indicates the lack of correlation between variables.

The third hypothesis test result:

The third hypothesis test results in table (10) are variable according to significance level in the company's healthy earnings per share (038/0) compared with the significant
The inverse relationship between revenues beta coefficient compared to operating cash flow as well as positive beta coefficient varies according to earnings per share (042/0) compared with a negative beta coefficient of operating cash flow (104 / 0-), fourth hypothesis is meaningful and positive. In other words between the revenue in comparison with the operational cash flow positive and strong relationship paved with making more profit in healthy companies relative to the bankrupt companies and there is a doubt in the region.

Tab. 10. The third hypothesis test results

<table>
<thead>
<tr>
<th>The bankrupt companies and in the area of doubt</th>
<th>Healthy companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/203</td>
<td>0/038</td>
</tr>
<tr>
<td>0/725</td>
<td>0/032</td>
</tr>
<tr>
<td>0/21</td>
<td>0/042</td>
</tr>
<tr>
<td>-0/057</td>
<td>-0/104</td>
</tr>
</tbody>
</table>

**CONCLUSION**

As mentioned, in this study, three hypotheses were examined. In the first hypothesis to assess the relationship between the earnings per share and profit making smoothly. According to the results achieved between earnings per share and a profit-making company smoothly towards healthy and bankrupt companies in the area of doubt, this hypothesis at the level of 95% significant can be accepted, and also due to mark the coefficient obtained was determined that the direct relationship between these two factors. In other words, if earnings per share rise, the company's profit up smoothly, and if the company's earnings per share reduced, profits down smoothly.

In the second hypothesis to examine the relationship between cash flow and operating smoothly making profit. The results of the tests of this hypothesis suggests that among the operational cash flow and making a healthy profit on the company smoothly compared to the bankrupt companies and the region is skeptical of this hypothesis in the 95% significance level will be accepted. But according to mark the coefficient obtained was determined that the inverse relationship between these two factors is established and the second hypothesis is not confirmed. As a result, among the operational cash flow and a healthy profit-making companies pave the relationship between positive and much more powerful than the bankrupt enterprises and the area of doubt using Altman does not exist.

In the third hypothesis to compare revenue and operational cash flow and profit-making the connection between them smoothly. According to the results achieved in the operational cash flow compared with the years before the more significant level, as well as with regard to the comparison of the mark, and the coefficient of operational cash flow a year ago between the two operating income and profit smoothly making direct relationship is established, if the mark according to the coefficient of operational cash flow a year ago that is between negative operating cash flow a year ago and paving construction The inverse relationship of profit is established. As a result of income compared to operating cash flow positive and strong relationship building with more smoothly compared to healthy gains in the company's bankrupt enterprises and the area of doubt using Altman.

When investors use financial basis for decision-making in relation to the investment in shares of the company or sell shares, making a profit of the phenomenon should be smoothly (and in later vast profit management more) attention. Relying on profits per share, regardless of the possible effects of the profit-making undesirable results can be smoothly. Understanding the features and limitations of the help it.

**REFERENCES**


