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# Investigating the Relationship between the Average Asset Age of Recognized Companies in Tehran Stock exchange with their Performance and Evaluating the Rationality of Market Reaction against Bubble of Indicator of Function

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## Abstract

Investors usually use the return ratios to make decision about the stock marketing. Under historical cost accounting, as the numerator of return ratios is measured based on the current values and the denominator of return ratios is measured based on the historical values, price rise, in case of inflation, causes the return rates inflate. In order to prove the existence of inflation in Return of Net Operating Asset (RNOA), the relationship between the RNOA and asset age was investigated and the results showed that there is positive relationship between RNOA and asset age. In the next step, in order to investigate the rationality of market reaction against the inflation in index of performance appraisal, the relationship between the market rate and asset age was examined and the results showed lack of relationship. The research was performed during 6 years (2006-2011) on 126 companies approved in Tehran Stock Exchange. The method used in testing the hypotheses was panel data which was done by Eviews7 software.

**Keywords**: Average Assets age, Return of Net Operating Asset, Comparability, Confirmation, Sincere Express

## Introduction

These studies are done based on the fact that the accounting rates of return such as the return of assets are important for the investors and used in decision making about investment. In fact, the factors outside of the function of company which are effective for the accounting rates of return can effect on the investment decisions. One of the factors investigated in this research was average asset age. Aging the assets of company suggests the lower historical cost of assets of company in the balance sheet and makes inflation in the accounting rates of return. In other words, we can say that there is direct and significant relationship between the accounting rates of return and asset age.

Due to the direct relationship between the return of asset and average asset age of company, it is expected that the participant trends to invest on the market rather than companies with old assets and it is predicted that the reason of this inclination is misconception of the relationships between the variables in the market.

In the historical cost accounting, as the numerator of return ratios is measured based on the current values and the denominator of return ratios is measured based on the historical costs, price rise, in case of inflation, causes the inflation of the return rates with effecting on the comparability, truthfulness and value relevance. Actually, the companies with old assets have higher rate of return than those with new assets and it does not show better function of that company. Now, we are discussing about whether, in the historical costs accounting, the accounting rates of return which are the criteria of evaluation are inflated and bubbled like ROA? If yes, do the participants of market perceive these bubbles and inflations in rates of return and interpret the information well? In this study, the dependent variables are the return of assets (ROA) and return of investors (Ret) and the independent variables is average assets age of company.

The investment rates of return are the important criteria for the users of financial reporting. The return of assets (ROA) and return of equity (ROE) are two common and available criteria for the users of financial

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reporting. Penman, in 2003, warned two principles in accounting, one was conservatism in accounting and the other was leverage. The evidences showed that the investors consider the inflation in ROE resulting from the leverage trivial (penman, 2007). Also, there are two-fold evidences suggesting that the investors consider the alternative replacement cost valuable. The previous studies of Beaver *et al* (1982), and Schaefer (1984) did not show the evidence regarding the usefulness of current price while Bernard and Ruland (1987) declared " when the correlation between the historical costs and replacement cost is low, the information about the cost replacement is useful for the investors".

Regarding the result of this research, it was essential to investigate that assuming the existence of inflation in accounting rates of return, do the investors perceive these inflations and don't need to disclosure the current values or the investors do not perceive the inflation and make the useful information about the current values available to the investors.

Accounting uses different methods of analysis for helping the users. One of these methods is using the accounting rates of return. The accounting rates of return can make connection between the profit and the sources creating profit and help analyze the condition of the company. Also, for evaluating the duty of supervisor, we cannot consider the final amount of gain, but also, the amount of sources available to the managers should be regarded. In the present study, due to removing the effects of the structure of capital and gaining the indexes showing the operational function of company, the Rate of Net Operating Asset (RNOA) resulting from dividing the Operating Income (OI) on Net Operating Asset (NOA) has been used. In case of inflation, due to increasing the assets costs, the rate of net operating asset is low for the companies which purchased their assets currently or replaced them and have more truthfulness and conversely, the companies with old assets report the inflated rate of net operating assets.

In other words, RNOA does not have comparability feature between companies. Regarding that high average asset age of companies suggests the oldness of their asset, we can expect that due to the low book value of these assets, the rate of return on asset face inflation. We can also expect that the return of asset is related to the average asset age. The operating assets are those which are used in the ordinary operations of company and produce the operating profit. Karine Benzacar (2009) suggested presenting the financial statements for applying the International financial reporting standards (IFRS) which in the sheet balance, the net assets are divided into five groups: Business, Financing, Income taxes, and the Discontinued Operations and Equity categories. Also the Business group is Operational and Investing. In the sample balance sheet, the net operating asset is calculated based on the bellow table (Benzacar, 2009).

**Table 1. Net operating assets**

| Description | UDS | USD |
|---|---|---|
| Operating assets: | | |
| Commercial and non-commercial receivable accounts | *** | |
| Inventories | *** | |
| Prepayments and orders | *** | |
| Net tangible fixed assets | *** | |
| Tangible assets | *** | |
| Goodwill | *** | |
| | | *** |
| Commercial and non-commercial payable accounts | *** | |
| Pre-receptions | *** | |
| Long term payable accounts | *** | |
| | | (***) |
| Net Operating Asset | | *** |

If the accounting information system reports the book value of assets based on the history cost, this makes the financial ratios like the rate of asset return face inflation due to shrinking the denominator. Increasing the rate of asset return is due to selecting the base of measurement, not the profitability of company. If the financial information effects on the behavior and reaction of participants in the market, we can say that the financial information effects on the market return. As discussed before, increasing the asset age which leads to representing the rate of asset return unreal and consequently if the investors are not aware of the inflations in the rate of asset return, they will be interested to invest and purchase the companies with older assets.

## Review of literature

Yaniv Konchitchki (2011) declared that the monetary assumption express that monetary is fixed and have stable purchasing power. He presents evidences regarding that during the periods in which the inflating and recession was trivial, the financial statements reject the monetary assumption and decrease the usefulness of indexes based profit.

Curtis and Lewis (2011) investigated whether the difference in asset age of company's effects on

the comparability of accounting rate of return and if there is significant relationship between the average assets age of companies and accounting rate of return. They found that there is significant relationship between the average asset ages of companies and accounting rate of return and the rate of return on asset is inflated and bubbled under the historical cost accounting.

Florou and Chalevas (2010) investigated the factors effecting on the value of a company and considered the relationship between the financial ratios and rate of return on asset. The result showed that the financial ratios effect on the return on asset significantly.

## Statement of the problem and research hypotheses

Before stating each hypothesis, it is essential to state the theoretical principles for perceiving well. In case of equal conditions, the difference between the asset ages of two companies artificially shows further the RNOA for the companies with old assets. Need to pay attention that if the companies replace their old assets with the similar assets, it will not be probable that the asset age effect on the RNOA systematically. As investment on the fixed assets is unorganized and the companies purchase the fixed assets in different periods, the asset age can effect on the RNOA systematically. So the primary hypothesis is defined:

*The first hypothesis: The criteria for evaluation of function of the companies with older assets are more inflated.*

In order to test this concept, the following hypothesis is codified:

H1: There is a significant relationship between the rate of net operational assets and average asset age.

If RNOA is inflated under the historical cost accounting due to the measurement of assets, so the RNOA is a misleading criterion for evaluating the function of companies with old assets. In other words, due to the weakness in measuring the historical, the more the assets of a company are old, the higher will be RNOA. The second hypothesis seeks to investigate whether the participants of market perceive this inflation or not, and whether the participants of market are interested in purchasing the stock of companies with old assets or not. So the second hypothesis will be:

*The second hypothesis: The participants in the market do not perceive the inflations in the criteria of function evaluation.*

In order to test this claim, the following hypothesis is codified:

*H2: There is a direct and significant relationship between the rate of return and asset age.*

*The operational definition of variables and the models of research*

Model (1) is a multivariate regression in which the effect of all independent and control variables on the dependent variables was investigated for testing the first hypothesis. Model (1)

$$RNOA_t = \alpha_0 + \alpha_1 RNOA_{t-1} + \alpha_2 AssetAge_t + \alpha_3 PM_t + \alpha_4 BP_t + \alpha_5 Size_t + \in_t$$

Model (2) is a multivariate regression in which the effect of all independent and control variables on the dependent variables was investigated for testing the second hypothesis. Model (2)

$$Ret_t = \beta_0 + \beta_1 AssetAge_{t-1} + \beta_2 FirmAge_{t-1} + \beta_3 BP_t + \beta_4 Size_t + \beta_5 TradeVol_t + \in_t$$

The rate of net operational asset (RNOA): This variable in model (1) was considered as the dependent variable which shows the rate of net operational assets for the company which is obtained from dividing the operating profit by net operational assets.

The rate of stock return (Ret): This variable was used as the dependent variable in model (2). According to the previous studies, the formula (1) will be calculated:

Formula (1)

$$Ret_t = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$$

Where Pt: stock price at the end of year t Pt-1: stock price at the end of year t-1 DT: the distributed dividends in year t for each share

*The average Asset Age:* This variable is used as the independent variable in model (1) and (2) and resulted from dividing the Accumulated depreciation by the historical cost of property, plant and equipment of companies.

*The ratio of profit margin (PM):* This ratio is obtained from dividing the operational profit by sale.

*The ratio of book value to the market value (BM):* This ratio is obtained from dividing the book value of company by market value.

*Corporate size:* To measure this variable, the natural logarithm of market value is used.

*Firm age:* This variable shows the age of approved companies in Tehran Stock Exchange.

*Trade volume:* This variable is the ratio of trade volume to the number of stocks.

## Materials and Methods

This research is based on the correlation method which uses the regression analysis for gaining the coefficient models. The correlation method is a kind of descriptive method.

In this research, the sample includes the companies approved in Tehran Stock Exchange between 2006 and 2012 and do not evaluate the fixed tangible assets and the number of these companies is 393. Based on the sampling conditions, 126 companies were selected by sampling.

## Data analysis

Models are divided into three groups of temporal, cross-sectional and panel with regard to the statistical data. One of the models of estimation used in this research was estimation based on "panel data".

## Results

### *Testing the first hypothesis*

**Results of testing the first hypothesis by primary testing**

In order to investigate the positive relationship between RNOA and Asset age and obtain evidences regarding this relationship, the companies are divided into five categories with the youngest (1Q) and the oldest (5Q) companies. Then the mean of RNOA, PM and ATO for each class was calculated. (Table 2)

**Table 2. Ranking the companies based on the asset age**

| Index of operation | Q1 | Q2 | Q3 | Q4 | Q5 | Q5-Q1 |
|---|---|---|---|---|---|---|
| RNOA | 0.127 | 0.167 | 0.202 | 0.238 | 0.273 | 0.146 |
| PM | 0.532 | 0.234 | 0.237 | 0.225 | 0.167 | (0.365) |
| ATO | 0.426 | 0.712 | 0.877 | 1.055 | 1.715 | 1.289 |

**Table 3. Ranking RNOA based on Asset Age and PM**

| Ranking based on PM | Ranking based on the Asset age | | | | | Q5-Q1 |
|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q5 | |
| P1 | 0.020 | 0.048 | 0.050 | 0.071 | 0.111 | 0.092 |
| P2 | 0.058 | 0.086 | 0.110 | 0.128 | 0.186 | 0.128 |
| P3 | 0.084 | 0.136 | 0.161 | 0.192 | 0.301 | 0.218 |
| P4 | 0.124 | 0.198 | 0.231 | 0.285 | 0.401 | 0.277 |
| P5 | 0.229 | 0.372 | 0.413 | 0.499 | 0.844 | 0.615 |
| Total Mean | 0.127 | 0.167 | 0.202 | 0.238 | 0.273 | 0.146 |

In order to investigate the inflation in performance index, the RNOA should be investigated regarding its elements. For instance, increasing the amount of RNOA for a company may result from the high economic function or vice versa. Also, it is probable that the inflation in RNOA be neutralized by low economic function. According to Table (3), it is determined that by controlling PM in RNOA changes, we can observe the inflation of operation index.

**Results of testing the first hypothesis using Model (1)**

In model (1), the kind of data will be determined using the Chow Test or binding F in which the H0 suggests equity of effects of constant and H1 suggest the incongruence of effects of constant and the results are shown in Table (4).

Based on the results of test and P value (0.000), H0 was rejected in 95% level of certainty and panel method should be used. in order to determine the effects (fixed or random), Housman test, in which the H0 suggests the random effects of constant and H1 suggests the fixed effects of constant are used. The results are shown in table (5).

As the scale of Chi-square is more than 0.05, randomizing the effects of constant are approved in panel data and the panel least squares with random effect should be used and its results are shown in Table (6).

**Table 4. Chow test or binding F**

| Test | Statistics | Scale | df | P-Value | Kind of data |
|---|---|---|---|---|---|
| Chow | F | 2.651494 | 125499 | 0.000 | Panel with effects of constant |

**Table 5. Housman test**

| Test | Statistics | Scale | Df | P-Value | The kind of effects of constant |
|---|---|---|---|---|---|
| Housman | Chi-Sq. | 0.000 | 5 | 1.000 | Random effects of constant |

**Table 6. Estimation of model 1 using the least panel least square with fixed effects of intercepts**

| | Dependent variable RNOA | | | |
|---|---|---|---|---|
| Independent variable | Coefficient | t | P-Value | Relationship |
| RNOA(-1) | 0.743491 | 18.88287 | 0.0000 | Direct |
| ASSETAGE | 0.255034 | 6.638371 | 0.0000 | Direct |
| PM | -0.113042 | -15.87837 | 0.0000 | Reverse |
| BP | 0.053408 | 21.11423 | 0.0000 | Direct |
| SIZE | 0.023957 | 15.00553 | 0.0000 | Reverse |
| C | -0.679734 | -16.5243 | 0.0000 | Reverse |
| | | R2 | | 63.98% |
| | | F | | 224.5150 |
| | | P-Value | | 0.000 |
| | | Durbin-Watson | | 2.0829 |

Regarding the coefficient of variable (0.225 asset ages) in Table (6) which suggests the positive relationship between the asset age and RNOA, the first hypothesis in 95% level of certainty will be approved.

**The results of testing the second hypothesis using model (2)**

The aim of testing the second hypothesis of research is to investigate the relationship between the market return and asset age and the statistical hypothesis is defined as:

H0: There is direct and significant relationship between return rate and asset age.

H1: There is not direct and significant relationship between return rate and asset age.

In order to test the second hypothesis, model (2) was used. Similar to testing the first hypothesis by model (1), for testing the second hypothesis with model (2), the efficiency of panel data with effects or panel data without effects was evaluated using the Chow test or limit F. The results of this test were shown in Table (7).

**Table 7. Chow test of binding F**

| Test | Statistics | Scale | Df | P-Value | Data |
|---|---|---|---|---|---|
| Chow | F | 0.886485 | 125499 | 0.888 | Panel without the effects of constant |

Regarding Table (7) and P value of F (0.888), the H0 is accepted in 95 % level of certainty the panel data without effects should be used. Its results are shown in Table (8).

**Table 8. Estimation of model (2) using the least squares of panel data without the effects of constant**

| | Dependent variable RET | | | |
|---|---|---|---|---|
| **Independent variable** | **Coefficient** | **Statistics t** | **P-Value** | **Relationship** |
| ASSETAGE(-1) | -0.00 | -24.3 | 0.0000 | Reverse |
| FIRMAGE | -2.61 | -15,500,000,000 | 0.0000 | Reverse |
| BP | 14.83 | 8,500,000,000 | 0.0000 | Direct |
| SIZE | 9.52 | 24,700,000,000 | 0.0000 | Direct |
| TRADEVOL | 0.00 | 16,800,000,000 | 0.0000 | Direct |
| C | -245.77 | -6,070,000,000 | 0.0000 | Direct |
| R2 | | | | 63.99% |
| F | | | | 7.3436 |
| P-Value | | | | 0.000 |
| Durbin-Watson | | | | 2.3556 |

According to 8, t statistics for of AssetAge (-1) is less than 0.05 and its coefficient is 0.00, the second hypothesis of research in 95 % level of certainty is not accepted.

## Conclusions

Based on the results, the first hypothesis was accepted in 95 % level of certainty the hypothesis about the positive and direct relationship between RNOA and asset age of companies is accepted. The direct relationship between the rates of net operational asset and asset age results from two factors. The first factor is inflation which causes the RNOA be inflated and the second factor is the manner of calculating the rate of return on asset. In order to calculate the assets of a company, the book value of fixed assets is used and it causes the older companies have lower book value than the newer ones. The second hypothesis is rejected and this suggests that the participants in the market don't react against the inflations in the indexes of performance appraisal.

## Recommendations of the study

Regarding the results in this research suggesting the direct relationship between the RNOA and Asset age, it is suggested to reevaluate the fixed tangible assets for the companies approved in Tehran Stock Exchange in order to remove the effects of inflation on the accounting rates of return. Also, the Accumulated depreciation should not be considered in the manner of calculating the accounting rates of return. Also, regarding the positive relationship between RNOA and Asset age, it is suggested to consider the Asset age as a control variable in the studies about the capital market.

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