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The Analysis and Evaluation of Profitability in Accepted Companies in Tehran Stock Exchange with ROA and ROE Approaches in Industrial Companies

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Abstract

Return on Equity (ROE) is one of the most important factors influencing the investor's decisions. By analysing the financial statements, the financial analysers are always trying to evaluate or identify the future profitability changes of the companies. In this study, the relation between ROE of industries entered into Tehran Stock Exchange was investigated. Herein the significant role of industry is expressed through operating and financial drives. The study data is taken from a sample consisting of 4 industries including 70 companies entered into Tehran stock Exchange during a 7-year time duration (from March 21st, 2012 to March 20th, 2019). Results indicate that there is a significant relation between ROE and its elements as per the industry and future profitability.

Keywords: Evaluation of the future profitability; Return on equity (ROE); Return on asset (ROA); Financial leverage; Industry.

1. Introduction

A major part of the academic studies have presented evidences regarding the benefits of profitability components to predict the future profitability. In the beginning, these studies were empirical, but this approach has been evolved as a more structural approach based on the analysis of financial statements for valuation of the capital (Amor-Tapia *et al.*, 2017). Relative profitability of a company in the industry as a measure of competitiveness reflects the company's commercial strengths and weaknesses and influences the stock return's reflection to the industry news. Relative profitability is influenced by the firm's operating decisions connected with the decisions of other firms of the industry. Therefore, this relational interdependence among the competing firms influences the cash flows of the firms and affects stock return behaviour of the companies. Thus, the stock returns of the firms with operational strengths have less sensitivity to industry news compared to weak companies (Kordestani and Bakhtiarpour, 2016).

Comparing the financial ratios of the firms with average ratios of industry is a common method for analysing the performance of a company. It has long been recognized that the financial ratios of the companies which are a member of an industry are delineated to that industry's averages due to competitive forces. This concept is based on the assumption that averages of the industry show a type of optimal operational structure. Accordingly, the financial analysts view the industry average as a good criterion to judge a firm (Palepu *et al.*, 2020). Present research aims at presenting strong empirical evidences about usefulness of including the information related to the industry to improve anticipation of profitability levels.

2. Relevant Literature

Amor-Tapia *et al.* (2017), studied the average relative effect (ROE) of industry in anticipating the firm's future profitability. The empirical studies required for this hypothesis show that profitability of a company in a competitive environment leads to return and tendency of profitability toward average. The companies with higher profitability attract the attention of other competitors and the newcomers cause reduction of profitability. Therefore, in two levels of high profitability and low profitability, average values of the (ROE) are more unstable and the profitability changes are more too. A firm research process has been created in the strategic management; the purpose of this type of research is to discover the importance of firm's specific impacts on industry and vice versa, which is measured by various profitability formulas and has led to establishment of definitive results. Although, the previous evidences have been partly distorted due to characteristics of statistical techniques and diversity of independent variables such as years, countries, industries and firms included in an industry to determine these effects, but they have proved the unquestioned role of the industry's impact on the firm's profitability.

Kordestani and Bakhtiarpour (2016) studied the impact of relative profitability of the firms on sensitivity of stock returns to industry news. As expected, the results obtained using the average returns of firms of the industry as a criterion for industry news showed that there is a reverse relationship among relative profitability of a firm and sensitivity of stock returns to industry news. This relationship can be interpreted using the competitiveness concept of industry's firms. The firms active in an industry have competitive strategies which create a relationship between operational decisions of the firms and thus, the cash flows of the firms are influenced by decisions of other companies in the firm and a dependence is created in stock returns of each industry's firms; therefore, relative profitability of a firm, as a competitiveness measurement, reflects the strengths or weaknesses in commercial operations and is able to explain the reaction of firm's stock returns to industry news.

Izadinia *et al.* (2015), studied the ability of accounting profit to predict and explain the stock returns. The results from their research showed that operating income of current year along with the book value to market value variable is a positive predictor of next year's returns and variation in operating income, has a good ability to explain the returns around the time of announcing the changes in the profit.

Hao *et al.* (2019), have described the relationship between relative profitability and sensitivity of stock returns to industry news using the Cornet competition method. In Cornet competition model, bipolar monopoly (an industry where two companies produce the same product) has been investigated.

Thomas and Zhang (2018), studied the overreaction to information transfer inside the industry. (Namazi and Rostami, 2016) studied and analysed the relationship between the stock returns rate and financial ratios. The results obtained from evaluating all of the companies and studying the industries separately showed that there is a significant relationship among the liquidity ratios, efficiency ratios, performance ratios, profitability ratios and market ratios with stock returns rate. In level of the whole firms, the liquidity ratios, efficiency ratios and market ratios and in group of different industries, liquidity and profitability ratios have high correlation coefficients.

Soliman (2014) used the Adjusted DuPont analysis based on type of the industry, to predict the future profitability. The conducted research emphasises the analysis of financial statements using DuPont ratio in predicting the future profitability of the firms. This article has studied whether the averages of profit margin (PM) and asset turnover operating (ATO) go back to values of economy level or the industry average is a better criterion. Also, it has been investigated whether applying the DuPont analysis using industry criteria will improve the future RNOA predictions or not?

Dechow *et al.* (2019) examined that correlation analysis between relative profitability variable of a firm with other variables show that the firms with more profitability compared to their other competitors in the industry, are larger in size and have a lower ratio of book value to market value and a lower level of financial leverage. The firms with a higher level of profitability are expected to have a greater capital gain compared to their rivals in industry; in other words, more investors are expected to invest in their stocks (According to findings of Zhang (2020); Biddle *et al.* (2019)).

Since the initial studies by Magee (2018), Evans and Schmalensee (2016), Rumelt (2019) until today, several factors have been mentioned as the reasons for industry's impact. Following this initial study, other articles have also focused on operating profitability aimed at determining the relationship among market value of RNOA components or predicting the future profitability. Despite the idea that profitability of a firm should mainly originated from the operating activities, we should know that the financial activities also play a role in profitability in a broader criterion.

3. Research Hypotheses

The research hypotheses are presented as follows:

1. Relative profitability condition of the firms in industry has a significant relationship with firm's next year profitability.
2. Components of ROE (net return on operating assets, financial leverage, surplus of asset returns compared to financial costs) have a significant relationship with the firm's next year profitability.

4. Research Design

This research has attempted to study the relationship among predicting the next year's levels (ROE) considering the firm's relative position of returns on equity (ROE) in the industry for the companies listed in Tehran stock exchange. In the first section, the variables are examined individually and the relationship among them is not considered. In this section, the central and dispersion indexes are calculated to obtain a general image of the studied population. Then, appropriate parametric and non-parametric tests are selected for the bivariate analysis, considering the type of the variables and also, their relationships in terms of dependence and independence. In this part, since all of the research variables have a rank scale of multi-valued type, so the appropriate test for determining independency and dependency of the variables is Pearson's correlation test. Finally, data panel (model fitting) will be performed for the third chapter and multivariate analysis. The statistical data analysis in this research has been done using the Eviews Software.

4.1. Research Population and Sample

Population of this research includes all of the firms present in Tehran Stock Exchange Organization from the beginning of 2012 to the end of 2019 and the model presented in table (1) has been used for sample selection. In this research, 70 firms or 490 years of firm are selected using the systematic elimination sampling method.

Table-1. Selection Process of Research Sample Firms

Description	Number
Number of the companies which have entered the Stock Exchange within the research time domain	592
Number of the companies which have got out of the Stock Exchange within the research time domain	140
Number of the companies in time domain of the research, the fiscal year of which does not end on 12/29	79
Number of the companies which have changed their fiscal year in time domain of the research	98
Number of the companies working in holding, investment and investment funds affairs within the time domain of the research	110
Number of the companies with over 3 month of trading pause within time domain of the research	48
Industries with low number of companies	47
Total deduction	522
Number of the studied firms	70

4.2. Research Variables

4.2.1. Dependent Variable

Dependent variable of this research includes:

1. Next year's returns on equity (ROE_{t+1})

Returns on equity Calculation Method:

ROE= Net Income / Share Holders Equity (1)

4.2.2. Independent Variable

SPINDU index ($SPINDU_t$): SPINDU is the firm's ROE minus the Industry's average value of ROE per country and year, deflected by the standard deviation of industry ROE.

$$SPINDU_t = \left[\frac{ROE_t - \overline{ROE_t}^{INDUSTRY}}{StDev_t^{\overline{ROE_t}^{INDUSTRY}}}\right] \quad (2)$$

4.2.3. Control Variable

1. The current returns on equity
2. Current year's RNOA: RNOA is Return on Net Operating Assets (Operating Income/Net Operating Assets)

ROE relationship can be broke into the following:

$ROE = ROA + (FLEV .SPREAD)$ (3)

3. FLEV: FLEV is Financial Leverage (Net Financial Obligations/Book value of common equity).
4. Spread :SPREAD is the difference between RNOA and Net Borrowing Cost (Net Financial Expense/Net Financial Obligations)
5. Size of the Company: previous researches show that size of the company may affect the performance. Size of the company is calculated through natural logarithm of the assets.

Regression Models of the Research:

Hypothesis Test Model 1:

$$ROE_{t+1} = \alpha_0 + \alpha_1 ROE_t + \alpha_2 SPINDU_t + \alpha_3 Size_t + £_{t+1} \quad (4)$$

Hypothesis Test Model 2:

$$ROE_{t+1} = \alpha_0 + \alpha_1 RNOA_t + \alpha_2 (FLEV_{t-1} \cdot SPREAD_t) + \alpha_3 SPINDU_t + \alpha_4 Size_t + £_{t+1} \quad (5)$$

5. Research Data Analysis

5.1. Descriptive Statistics

Descriptive statistics includes mean, median, and standard deviation, maximum, minimum, Skewness and kurtosis for the variables studied in this research presented in table (2).

Table-2. Descriptive Statistics of Research Variables

Variables	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis
ROE	36.848	29.875	85.415	10.472	18.375	0.789	2.583
SIZE	5.316	5.348	7.067	3.367	0.715	-0.325	2.986
LEV.SPREAD	-144.014	1.717	118.845	-15922.04	872.500	-13.307	224.495
RNOA	20.659	12.659	99.000	0.000	23.347	1.893	6.356
SPINDNU	3.69	0.026	3.477	-21.211	1.00	-19.42	415.252

Normality of the remains of the regression model is one of the regression hypotheses which show the validity of regression tests. Further, distribution normality of dependent variables was studied using the Jarque-Bera Test.

Normality of dependent variables leads to normality of the Model's remainders. Thus, normality of the dependent variable is required to be controlled before estimating the parameters and in case of absence of this condition, a suitable solution must be adopted to normalize them (including transferring them). The results from Jarque-Bera Test is presented in table (3).

Table-3. Dependent Variable Normality Test of the Research

Jarque-Bera Test		Dependent Variable
Probability	**Statistic**	
0.00	54.3	ROE_{t+1}

Considering abnormality of dependent variables, the data are normalized using the Minitab Software, by applying Johnson's transfer method, the results of which is presented in table (4).

Table-4. Descriptive Statistics of Dependent Variable after Normalization

Variables	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis	Jarque-Bera Test
ROE_{t+1}	53.755	54.005	195.072	58.63	40.995	0.079	3.002	0.096

5.2. Testing the Hypotheses

The reasons for selecting the statistical method: since there are more than one type of independent and control variables, panel or pooled regression model fit is used to study the influence of this variable on dependent variable. In other words, panel or pooled regression is used considering the significance level of Limer test, in order to study the relationship between independent and dependent variables. In this test, when the significance level is smaller than 0.05, panel (pooled) regression is selected to fit the model. The panel fit itself has two forms of random effect and fixed effect. Considering the Hausman test, random or fixed fitting is used. In this test, random fit is used whenever the significance level is higher than 0.1.

F Limer Test and Fit of the Models in terms of Industry: According to the econometric literature of panel data, before estimating the model, it is required to be tested using the F Limer data homogeneity test statistic and as a result, using the pooled data estimation method. The results from F test statistic imply the significance of using the pooled data method instead of panel method. The results from this test have been presented in the following table.

First Model of F Limmer test: Different tests are used to determine the type of the model applied in pooled data. The test results from determining model of the first hypothesis have been summarized in table (5).

Table-5. The Test Results from Significance of Fixed Effects versus the Accumulate Least Squares Method for the Research Model

Results	Significance	Statistic	Industry	Test	Hypothesis
Pool model	0.42	1.0007	Industry1	Pooled	First hypothesis
Pool model	0.98	0.186	Industry2		
Pool model	0.78	0.53	Industry3		
Pool model	0.99	0.084	Industry4		

Industry (1): cement, lime, plaster and non-metallic minerals of the industry, (2): foods except sugar loaf and sugar, and sugar loaf and sugar in the industry, (3): Chemicals and pharmaceutical substances, industry, (4): textiles

Therefore, the research model will be tested using the pooled regression method. The results from regression model test of the first hypothesis have been presented in table (6).

Table-6. Model Estimation Results of First Hypothesis

$ROE_{t+1} = \alpha_0 + \alpha_1 RNOA_t + \alpha_2 (FLEV_{t-1} \cdot SPREAD_t) + \alpha_3$ SPINDU$_t$ + α_4 Size$_t$ + $£_{t+1}$				
Variable	**Industry(1)**	**Industry(2)**	**Industry(3)**	**Industry(4)**
C	-28.878	67.323	55.301	18.636
ROE	0.463*	0.618*	0.919*	0.934*
SPINDU	335.554*	436.513*	671.815*	663.380*
SIZE	-5.309	-7.159	-9.025	-2.015
R^2	0.46	0.606	0.907	0.926
F Statistic	43.53	132.49	537.12	602.07
Durbin-Watson statistic	2.00	2.05	1.7	1.93

Industry (1): cement, lime, plaster, non-metallic minerals of industry, (2): foods except sugar loaf and sugar, and sugar loaf and sugar in the industry, (3): Chemicals and pharmaceutical substances, industry, (4): textiles

The model estimation results using the pooled regression model shows that an increase in ROE_t variable or its increase has an effect on profitability, because significance level for this variable has been obtained using the T statistic which is smaller than 0.05. Therefore, in level of 0.95, this variable affects the profitability of the company. Increase in SIZE variable or its decrease has no impact on profitability, because the significance level for this

variable has been obtained by T statistic which is larger than 0.05. The Durbin-Watson statistic amount is placed within range of 1.5 to 2.5, namely the errors have no correlation in the model.

Second Model of F Limer Test: The results from the model determination test of the second hypothesis have been summarized in table (7).

Table-7. The Significance Test Results of Fixed Effects versus the Accumulated Least Squares Method for the Research Model

Results	Significance	Statistic	Industry	Test	Hypothesis
Pooled model	0.509	0.88	Industry1	Pooled	Second hypothesis
Pooled model	0.98	0.15	Industry2		
Pooled model	0.82	0.46	Industry3		
Pooled model	0.99	0.069	Indistry4		

Industry (1): cement, lime, plaster, non-metallic minerals of industry, (2): foods except sugar loaf and sugar, and sugar loaf and sugar in the industry, (3): Chemicals and pharmaceutical substances, industry, (4): textiles

Therefore, in this section, the research model will be tested using the regression by applying the pooled method. The regression model test results of second hypothesis have been mentioned in table (8).

Table-8. Model Estimation Results of the Second Hypothesis

$ROE_{t+1} = \alpha_0 + \alpha_1 RNOA_t + \alpha_2 (FLEV_{t-1} \cdot SPREAD_t) + \alpha_3 \text{SPINDU}_t + \alpha_4 \text{Size}_t + £_{t+1}$

Variable	Industry(1)	Industry(2)	Industry(3)	Industry(4)
C	35.949	49.208	49.442	17.891
NROA	9.909	-0.696	0.545	-0.010
LEVSPREAD	-4.902	0.253	-0.229	0.000
SPINDU	332.549*	440.703*	669.250*	663.571*
SIZE	-31.095	-3.141	-9.072	-1.929
R2	0.47	0.609	0.91	0.926
F Statistic	22.09	66.32	266.92	259.04*
Durbin-Watson statistic	2.00	2.06	1.68	1.94

*significance in 95% level

Industry (1): cement, lime, plaster, non-metallic minerals of industry, (2): foods except sugar loaf and sugar, and sugar loaf and sugar in the industry, (3): Chemicals and pharmaceutical substances, industry, (4): textiles

Increase in NROA variable or its reduction has no effects on profitability, because the significance level for this variable has been obtained with T statistic which is larger than 0.05. Increase in SPINDU variable or its decrease influences the profitability, because the significance level for this variable has been obtained by T statistic which is smaller than 0.05. Therefore, this variable affects next year's profitability in 0.95 levels. Increase in SIZE variable or its decrease has no effects on profitability, because the significance level for this variable has been obtained with T statistic which is larger than 0.05. Increase in LEV. SPREAD variable or its decrease has no impact on profitability, because significance level for this variable has been obtained by T variable which is larger than 0.05. Amount of Durbin-Watson statistic is placed within the range of 1.5 to 2.5, namely the errors have no correlation in the model.

6. Discussions and Conclusion

The aim of this research was to estimate next year's profitability, considering the relative profitability condition of the firms for the industry. The results imply that both hypotheses have been proved. To estimate the investment returns, the information content resulted by last year and current year's profitability of the research can be used, while by arrival of profitability average index of the industry, determination coefficient of future profitability prediction is increased. The underlying idea of this conclusion is clear too, because investment returns is affected by industry's structure too. Industry supports the distinctiveness of the product which leads to competition. On the other hand, absence of desirable structure results in decrease in profitability. Results of this research are consistent with the research conducted by Amor-Tapia *et al.* (2017). By considering the relative condition of returns on equity to the industry in their research, they attempted to improve the firm's next year returns on equity estimation, the results of which are consistent with the results of the first variable. They also presented evidences on impacts of first level stimuli (operation factor, financial factor) and second level stimuli (profit margin, asset turnover rate, financial leverage and return of the difference among net returns of the operating assets and net cost of borrowing) based on the industry, in estimating the future profitability which are consistent with results of the second hypothesis.

Among the other similar researches consistent with present research from some aspects, the study by Thomas and Zhang (2018) can be mentioned. The results from their research showed that declaring the interests of a company includes information contents not only for the firm itself, but for the other firms active in the industry. The results of the research by Soliman (2014) showed that calculating the period features of DuPont ratio components (retail, industry and retail, abnormal) will help predicting the future RNOA changes. DuPont's old analysis breaks the return on equity (ROE) to ratio of net profit to sales (profit margin), asset turnover rate and multiplier of the equity.

7. Practical Suggestions

- Results of this research have important implications for the investors, financial analysts and other users of financial statements, because they can achieve higher competitiveness, considering the industry-related information with simple methods.
- The firms can also, take a step forward by determining their own profitability position and condition in the related industry, toward improving the future profitability and eventually, gaining capital.
- Also, results of this research are applied to evaluate advantages of the divided financial statements based on operating and financial activities.

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