Study of the effect of Financial Leverage ratios and Profitability Ratios on the Economic value added in Companies listed in Tehran Stock Exchange

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ABSTRACT
The purpose of writing this research, is to evaluate the effect of financial leverage ratios and the ratio of profit on Economic Value Added in listed companies is in Tehran stock and how much relationship exists between financial leverage ratios, profitability ratios, and Economic Value Added in listed companies the Tehran stock exchange. The research method used in this research is descriptive research method (correlation) because purpose is expressing the relation between financial leverage and profitability ratios, with economic value added. The purpose of this study is applicable. The data collection of the stock exchange market was done by RAHAVARD NOVIN software and for analysis of the data, E views software was used. To test the research hypothesis, with the use of final model estimation through multi-variate regression of the panel data, significant relationships were discovered in order to provide the model. Use limitations listed in Chapter three, a sample consists of 180 companies, were selected from 423 companies listed on the Stock Exchange Tehran, between the years of 2007 to 2011. To test the significance of the research hypothesis, the generalized Least-squares regression was used. In this study, listed firms of stock exchange within the period (2006-2011) were selected. Research findings indicate a positive and significant relation between financial leverage ratio and profit ratio on the economic value added of the companies listed in Tehran stock exchange.

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INTRODUCTION

EVA is not a new concept. One the performance indicators of accounting is the residual profit which is defined as operational profit after deduction of capital expenditure and EVA is actually the modified version of the residual profit along with adjustments which are applied on profit and capital. In 1970s, and before that, and residual profit did not have use and fame. Nevertheless, EVA in actuality is a similar concept with a different name which its use is expanding and every day the number of companies using it increases. Proponents of EVA concept claim that this index is the best measure of the performance, because as an evaluation criterion, considers opportunity cost of shareholders and time value of money and eliminate distortions caused by the application of accounting principles. EVA unlike the usual criteria of profitability, helps management in understanding the capital cost of shareholders and is the actual index of success of the company in value creation or destruction.

Defining the problem and research objectives:

Creating value and increasing shareholder wealth are the most important objectives of the companies in the long term. Maximizing the corporate value needs execution of the profitable projects by them. Implementing profitable projects also required funds. The existing strategies for providing capital expenditure are effective on the provision of corporate capital structure. Selecting the kind of supplying funds, including issuance of shares or bonds or taking loans are effective on the suitable structure of the capital and the capital structure affect the total value of the company. To optimize the capital structure of the firms, the identification and understanding of their different financial resources and costs incur upon providing them has especial importance for financial managers of the companies to make decisions for financial supplies for maximizing the company value [13].

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Wealth increase will occur just by suitable performance. Maximizing company value happens when the company has financial health i.e. the financial resources are properly selected (supply task) and used properly (application task) [15,6,9]. Different criteria for evaluating the performance of business units has been proposed so far. EVA is one of the newest of these criteria. This criterion was first introduced by a management consulting firm called Stern and Stewart. Steward believed that other measurement indexes and operation assessments such as earning per share and dividends are not complete measurement indexes and Economic value added is more complete and applicable compared to them, as economic value added is a more appropriate measure for evaluating the performance of a company as it is related to the changes in shareholder wealth. Based on these criteria, the value of a company is dependent on two factors: 1) How much is the company's return on capital used in the business; and 2) how much incur the company by the capital used. Therefore, the difference between economic value added and other performance assessment indicators is that in determining EVA it is tried to consider all financial resources [13].

**Literature review:**

**Foreign Research:**

Different studies have different conclusions about the superiority of EVA as performance evaluation over traditional measures of operations like profitability. Therefore, some researchers believe that still some of the traditional criteria for evaluating the performance such as profit and loss ratios and balance sheet ratios are appropriate criteria for evaluating their performance. Economists believe that a company can creates wealth which its income is more than its capital expenditure. This concept became operational in the twentieth century under different names, such as residual profit. The residual profit is an internal criteria for evaluating the performance of the business unit and an external criterion to evaluate the performance of financial reporting. Stern and Stewart tried to use conventional accounting data after the required adjustments to calculate EVA in 1980s.

Stewart Stern Company (1991) believed that the best criterion for evaluating the internal and external performance is economic value added and substituted this criterion with the previous accounting measures such as earnings and cash flows related to operations. This company believed that earnings per share, return on shareholders' rights, and return on equities must be put aside until economic value added become determining factor for share price and a base for evaluating performance.

In 1996, Dad and Chen in a research studied the relationship between performance assessment criteria and dividend yield in a sample comprised of 566 American companies from 1983 to 1992. Their Performance evaluation criteria included: economic value added, return on assets, earnings per share, return on equity and residual profit, the calculated determination coefficient for return on assets was 24.5%, which indicates that the return on assets has the highest correlation with dividend yield. Determining factor of EVA was 20.2 %, 19.4 % for residual profit and other variables explain between 5-7% of the variation in dividend yield. On the other hand, the results showed that the cost of capital and return on capital have the highest correlation with the yield (R2 =26/1%). The results doubted the claim that the most important reason for the emergence of economic value added is the company's attention to cost of capital.

Yet and Hall (2004) believed that when a company is not at its optimum level of capital structure, change in its ratio of debts to the total assets (Financial leverage) could decrease its harmonized mean capital cost and in this regard the capital structure of the companies affects their values. The criteria value of the companies includes total value of the company market, economic value added and total value of the company market, therefore, a change in financial structure of the companies could effect on the total value of the company, its economic value added and market value added.

Dravhvzal (2006) examined the relationship between capital structure and the operation of the six companies in the energy industry in the Czech Republic. His research criterion for capital structure was financial leverage and for performance assessment, the criteria was discounted free cash flow. After determining the suitable structure of the capital for these six companies, he concluded that current companies in Czech Energy industry are less trying to provide funds through barrowing from external sources and as a result, their performance are lower than the operations that can have with a suitable capital structure.

Madi Tinos et al. (2009) studied the criteria of EVA and market value added and earning per share and return rate on equities and concluded that economic value added and earning of each share are more explainable and applying both factors in the model will provide a better result.

**Domestic research:**

In 2000, Nazari conducted a study entitled "Evaluation of the relationship between earnings per share and economic value added in companies with non-metallic mineral products" and concluded that there is no relation between economic value added and earnings per share with 99% of CI [10].

In 2001, Rezayi conducted a research on the correlation between economic value added and return on equity in the assessment operation of company of transportation vehicles industry listed in Tehran stock
Exchange. The result of the hypothesis test showed that there is a significant correlation between economic value added and return on Equities in car manufacturing companies enlisted in stock exchange (Rezayi, 2001).

Ghanbari (2002) examined the relationship between EVA and financial ratios of the companies listed on the Tehran Stock Exchange. He concluded that the relationship between economic value added and sixteen evaluated financial ratios such as profit to sales, and profit to capital.

In 2003, Kavossiin this study examined the relationship between Tobin's Q ratio and EVA in the companies listed in Tehran Stock Exchange. The results showed that there is a significant correlation between Q Tobin ratio and EVA and as a result the Q Tobin ratio could be a replacement for EVA [7].

In 2004, Anvar Rostami and colleagues studied the relationship between EVA, profit before interest and tax and cash flow of valuable operation activities of stock market of companies listed in Tehran stock exchange. The results indicated that earnings before interest and taxes have correlated more with the market than the economic value added [1].

Noroush et al. (2004) studied the relation between operational cash flow, profit and EVA with the created wealth for shareholders and concluded that EVA was a better indicator for predicting the created wealth for shareholders.

Noroush and Mashayekhi (2004) examined the usefulness of Economic Value Added to predict accounting earnings in production companies in the interval from 1992 to 1996. They reported a significant correlation between changes in accounting earnings and economic value added in these companies.

Zahiri (2007) examined the relationship between economic value added and the valuable earnings per share of the companies listed in Tehran Stock Exchange 2000-2004. The results showed that EVA has correlated more with the earnings per share of any valuable market share.

Research hypotheses:
The main hypothesis of this study:
1. There is a significant correlation between the financial leverage ratios and economic value added of companies listed in Tehran Stock Exchange.
2. There is a significant correlation between the profit ratios and economic value added of companies listed in Tehran Stock Exchange.

Secondary research hypotheses:
The first sub-hypothesis:
1. There is a significant relationship between debt ratio and EVA.
2. There is a significant relationship between ownership ratio and EVA.
3. There is a significant relationship between EVA and cost of interest coverage ratio.

The second sub-hypotheses:
1. There is a significant relationship between net profit margin and EVA.
2. There is a significant relationship between EVA and return on total assets ratio.
3. There is a significant correlation between ROE and EVA.
4. There is a significant relationship between Operating margin profit and EVA.
5. Increase the level of financial leverage has an effect on the economic value added.
6. Increase in the profitability ratios affect the amount of economic value added.

Methodology:
Research Method:
Considering that the aim of the study was to investigate the effect of financial leverage ratios and profitability ratios on economic value added, so the research method used is correlational. This study is applicable with regard to its purpose, because in applied researches we seek solutions to the problems. Data collection of Stock Exchange was done by using RahavardNovin Software. Data analysis and extraction of descriptive statistics were done by SPSS software. E views software was used for inferential statistics.

The statistical population and sample selection:
The population of this study includes all companies listed on Tehran Stock Exchange (430 companies up to 20th March 2011) during the period from 1385 (2007) to the beginning of the solar year 1390 (2011) (5 years). Sample consisted of listed companies and selected according to the following conditions: 1. their fiscal year ends in March. 2. Their Trading break was up to 3 months except for holding a general meeting of shareholders. 3. Banks, financial institutions, investment and holding companies, due to their differences in activity were excluded from the sample. 4. Unprofitable companies were disregarded. 5. The surveyed companies have available data. 6. No change in the fiscal period during the study period. Finally, after compliance with the
above provisions, out of 430 companies listed on the Stock Exchange by the end of 2010 (the beginning of the solar year 1390) 180 companies were selected.

Measurement Model:
As it is seen in Table 1, to measure the concepts of the research in this section, the operational definition of the variables for testing data and statistical of the research has been shown.

Table 1: How to calculation of research variables.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Financial ratio</th>
<th>How to calculate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic value added (EVA)</td>
<td>1)</td>
<td>( r-c ) X capital – EVA</td>
</tr>
<tr>
<td>Profitable ratios</td>
<td>2)</td>
<td>Return on Equities (ROE)</td>
</tr>
<tr>
<td></td>
<td>3)</td>
<td>Return on assets (ROA)</td>
</tr>
<tr>
<td></td>
<td>4)</td>
<td>Ratio of net profit over the mean of total assets</td>
</tr>
<tr>
<td></td>
<td>5)</td>
<td>Ratio of marginal net profit</td>
</tr>
<tr>
<td></td>
<td>6)</td>
<td>Proprietary ratio</td>
</tr>
<tr>
<td></td>
<td>7)</td>
<td>Debt ratio</td>
</tr>
<tr>
<td></td>
<td>8)</td>
<td>Ability to pay interest ratio</td>
</tr>
</tbody>
</table>

Analysis of data:
Testing the research hypothesis:
The findings
To test the first, second and third hypotheses of main hypothesis, the following regression model has been used.

\[
Y_i = a_0 + B_1X_{1i} + B_2X_{2i} + B_3X_{3i} + \varepsilon
\]

\(Y_i\): Dependent variable Economic value added
\(X_1\): Independent Variable debt ratio
\(X_2\): Independent variable proprietary ratio
\(X_3\): Independent variable cost coverage of interest ratio

Table 2: Final estimation of combined data regression model (generalized least-squares).

<table>
<thead>
<tr>
<th>Model components</th>
<th>1996-2000 (1389-1385 Solar calendar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta ) coefficients</td>
<td>Standard error</td>
</tr>
<tr>
<td>Y-intercept</td>
<td>36.64772</td>
</tr>
<tr>
<td>Independent variable of debt ratio</td>
<td>-10.72757</td>
</tr>
<tr>
<td>Independent variable of proprietary ratio</td>
<td>-0.092039</td>
</tr>
<tr>
<td>Independent variable of interest cost coverage (ARI)</td>
<td>9.0105</td>
</tr>
<tr>
<td></td>
<td>0.243015</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.107277</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.107205</td>
</tr>
<tr>
<td>F-statistics</td>
<td>4815.484</td>
</tr>
<tr>
<td>Prob(F-statistics)</td>
<td>0.000000</td>
</tr>
<tr>
<td>Lag</td>
<td>0.40</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.051405</td>
</tr>
</tbody>
</table>

The above table shows the results of the first, second and third sub-hypotheses of the main research hypothesis for all the study years and because of using cross-sectional data, to eliminate heteroscedasticity, the generalized least square method is used. As you can see \(t\) coefficient and statistics related to debt ratio, proprietary ration and interest cost coverage is significant at 95% CI (significant level is lower than 1% and absolute T is greater than 2). There are negative and inverse relationship between debt ratio and proprietary ratio with dependent variable (EVA). Also, there is a direct and positive correlation between interest cost coverage
with dependent variable (EVA). On the other hand, Durbin-Watson statistics has been calculated for the first regression model which shows that this figure is between 1.5 and 2.5 and confirms no correlation in components of the above regression model. And the determining coefficient number of research model shows that in total; nearly 0.11% of the changes in dependent variable could be explained by independent and significant variables in this model which shows the high power of the model in explaining the behavior of the dependent variable. Regarding the 0.000 probability of F statistics, the proposed regression model is within 99% CI and the all regression is significant.

To test the first, second, third and fourth sub-hypotheses of thesecondmain hypothesis, the following regression model is used.

\[ Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \epsilon \]

Y: Dependent variable Economic value added
X1: Independent Variable net margin profit ratio
X2: Independent variable return on all assets ratio
X3: Independent variable return on Equities ratio
X4: Independent variable marginal operational profit

### Table 3: Coefficients of regression of panel data method.

<table>
<thead>
<tr>
<th>Model components</th>
<th>( \beta ) coefficients</th>
<th>Standard error</th>
<th>T statistics</th>
<th>Significant level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>26.03419</td>
<td>0.007748</td>
<td>3360.276</td>
<td>0.0000</td>
</tr>
<tr>
<td>Independent variable of Net margin profit ratio</td>
<td>-0.039277</td>
<td>0.001470</td>
<td>-26.72410</td>
<td>0.0000</td>
</tr>
<tr>
<td>Independent variable of return on all assets ratio</td>
<td>0.035321</td>
<td>0.000535</td>
<td>66.01248</td>
<td>0.0000</td>
</tr>
<tr>
<td>Independent variable of return on Equities</td>
<td>-0.002425</td>
<td>0.000284</td>
<td>-8.531581</td>
<td>0.0000</td>
</tr>
<tr>
<td>Independent variable of marginal operational profit</td>
<td>0.039352</td>
<td>0.001471</td>
<td>26.74957</td>
<td>0.0000</td>
</tr>
<tr>
<td>ARI</td>
<td>0.185060</td>
<td>0.002507</td>
<td>73.82082</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

### Table 4: significant test of total model

<table>
<thead>
<tr>
<th>Determining coefficient</th>
<th>Adjusted coefficient</th>
<th>F statistics</th>
<th>Significance level</th>
<th>Durbin-Watson Statistics</th>
<th>F Limer statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.121764</td>
<td>0.121736</td>
<td>4447.02</td>
<td>0.00000</td>
<td>2.038089</td>
<td>0.1620</td>
</tr>
</tbody>
</table>

Table (3), shows the net result of the model related to first, second, third, and forth sub-hypotheses of the second main hypothesis for all years which due to use cross-sectional data, the generalized least square method was used to eliminate heteroscedasticity. As you can see coefficient and t-statistics related to the net profit ratio, return on total assets ratio and return on equity variable, and independent variable of operating profit margin are significant at 99% CI (significance level of less than 1% and absolute T greater than 2). The variables of net profit Ratio margin, and return on equity ratio have an inverse and negative relationship with the dependent variable (EVA). Meanwhile, the variables of operating profit ratio and return on total assets have positive and direct relationship with the dependent variable (EVA). On the other hand, Durbin-Watson statistics has been calculated for the first regression model which shows that this number is between 1.5 and 2.5 and confirms no correlation in components of the above regression model. And the determining coefficient of the research model shows that in total; nearly 13% of the changes in dependent variable could be explained by independent and significant variables in this model which shows the high power of the model in explaining the behavior of the dependent variable. Regarding the 0.000 probability of F statistics, the proposed regression model is within 99% CI and the whole regression is significant.

Tests of fifth and sixth sub-hypothesis of the second main hypothesis:

With regard to the output of Table 2, among financial leverages, only the variable of interest cost coverage ratio has a direct and positive relationship with dependent variable (EVA), i.e. with increase in the variable of interest cost coverage ratio, the EVA increases. With regard to the output of Table 3, among profiting leverages, the variables of return on total assets ratio, and operating profit margin, have a direct and positive relationship with dependent variable (EVA), i.e. with increase in the variables return on total assets ratio, and operating profit margin, the EVA increases.

Discussion and conclusions:

The present research, presents empirical evidence indicating the presence of a positive and significant relation between financial leverage ratios and profiting ratio with economic value added in companies listed in Tehran stock exchange. Reviewing carefully other researches inside and outside the country, we observe so many similarities between results of the resent research and other researches. In this chapter we briefly
mentioned some of these researches. First, the dependent and independent variables were calculated and tested by panel data analyses for each year. Then, the method of multivariate regression results using generalized least squares of the entire data for analyzing a sample of 180 companies listed in Tehran Stock Exchange, between the years 1996 to 2011 were used. To determine the method of using panel data using panel data or pooling, the Limer test was used, in order to make decision about rejection and acceptance of the equality of the individual companies’ outcomes and selection of the classic method or methods of panel data that ultimately were more consistent with the obtained results from pooling model. In general, the results of the research were significant at 99% confidence level (significance level of less than 1% of the absolute value of T is greater than 2). And variables of debt ratio and proprietary ratio have inverse and negative relationship with the dependent variable (EVA). Also, the variable of interest cost coverage ratio has a direct and positive relationship with the dependent variable (EVA). And the variables of net profit margin ratio and return on equity ratio have negative and inverse relationship with the dependent variable (EVA). Also, the variables of return on total assets ratio and operating profit margin have a direct positive relationship with the dependent variable (EVA). Regarding both hypotheses, the whole regression model is significant. Regarding the researches done inside and outside of the country, we understand to some extent the important role of financial leverage ratios and profitation ration on economic value added of the companies. Therefore, regarding the results, we recommend the investors (during making decisions and necessary predictions about investments), beside using main financial statements, to consider more carefully assessment of financial criteria, especially economic value added and its measurement in intended companies and organizations. With regard to the obtained results, it can be suggested that EVA through capital and share market, can be prioritized for the companies and with putting aside the traditional criteria of performance, have more precision in presenting information of financial statements and their presentation to consumers.

REFERENCES


