The relationship between the measures of working capital and economic value added (EVA) a case study of companies listed on the Tehran Stock Exchange

Amir Mosazadeh*
Department of Accounting, Germi Branch, Islamic Azad University, Germi, Iran
Branch Management Department of Bank Tejarat, Ardabil, Iran
*Corresponding Author

Azim Aslani
Department of Accounting, Germi Branch, Islamic Azad University, Germi, Iran

Mohammad Hassanzadeh
Department of Accounting, Germi Branch, Islamic Azad University, Germi, Iran

Abstract

In this study, the relationship between the measures of working capital and economic value added (EVA) in the companies listed on the Tehran Stock Exchange is examined. The study population consists of 430 companies, which have been accepted in Tehran Stock Exchange until 2008. In this study, the simple random sampling is applied, and in order to determine the relationship between the variables E-Views software is used. In this study, working capital management criteria includes the period of collection of receivables, inventory turnover period, the period of debt repayment, and cash conversion cycle. The results of this study indicate that working capital management is correlated with Economic Value Added (EVA) of companies listed on the Tehran Stock Exchange. In other words, there is relationship between the period of debt payment and EVA, the period of collection of receivables and EVA, and the period of repayment of debt and EVA. The findings also show no relationship between inventory turnover and economic value added (EVA) of firms listed in the Tehran Stock Exchange.

Keywords: working capital management, economic value added (EVA), data panel method, the Stock Exchange.
1. Introduction

As owners of business entities, shareholders seek to increase their wealth, and due to the fact that increased wealth is a result of favorable performance of business entities, evaluation of business entities is very important to the owners. The discovery of economic factors that lead to the creation or destruction of wealth is highly important for investment managers and corporate executives. For corporate executives, wealth creation is essential for economic survival. Managers in a market economy who ignore the importance of this issue, compromise businesses and their owners. Find the best companies and industries is of great importance for investment managers. With accurate analysis tools, portfolio managers may be able to change their passive strategies with higher returns and the same initial risk to an active performance (Anvari Rostami et al., 2003).

There are different criteria to measure and judge the performance of a company. Failure to use the proper metrics to measure the performance and value of a company's stock causes the company's value not lead to the actual value, resulting in losses of a group of shareholders and huge profit of others (Mosazadeh, 2014).

Performance measurements have been classified in different ways; one is to classify them into two categories of accounting measures and economic measures. In accounting measures, business entity’s performance is evaluated by multiplying the company's profit in dividends to the value adjustment factor. In economic measures, business entity’s performance is evaluated by the profitability of existing assets and potential investments and the difference between the rate of return and cost of capital.

One of the most important indicators of performance evaluation that considers the cost of capital is economic value added (EVA). Based on this measure, the value of a company depends on two factors: 1) Return on capital employed by the company 2) Cost of capital employed by the company.

The difference between EVA and other performance measures is that it attempts to consider cost of all financing sources. Another indicator that can be used as a suitable indicator is Tobin's Q ratio. In general, Tobin's Q ratio is calculated by dividing the company's market value to book value or replacement value of assets. If the calculated indicator for a company is higher than one, there is plenty of incentive to invest there. If the calculated indicator is smaller than one, investment will stop (Wolfe, 2003).

Therefore, in this study, the relationship between measures of working capital and economic value-added of companies listed on the stock exchange will be examined. To do so, the data and
information for 127 companies in the period 2009-2012 is collected, and the desired model is estimated using data panel method and Eviews7.0 software.

2. Theoretical framework and literature review

There are different measures for evaluating the performance of companies. One of these measures is the economic approach in which economic concepts are mostly used to evaluate performance of business units. In this approach, the entity's performance is evaluated with emphasis on profitability of the company's assets and the rate of return and the rate of cost of capital employed. Economic value added (EVA) is an example of this approach. EVA was first developed by Stern Stewart. According to him, for evaluating the performance of managers, EVA is one of the most efficient measures, which is calculated as follows (Stewart, 1991):

\[ \text{EVA} = \text{NOPAT}_t - (\text{WACC} \times \text{Capital}_{t-1}) \]

Where NOPAT is net operating profit after tax, WACC is weighted average cost of capital, and Capital is the company's net asset value used to calculate NOPAT. In this formula, adjustments are applied to the operating profit reported in the financial statements accounting.

After the introduction of EVA by Stuart, some other economists introduced another adjusted measure (which is based on the economic value added) as retained economic value added (REVA). According to them, in the calculation of REVA, market value of assets must be used instead of their retained book value.

Finally, other economic measure as market value added (MVA) was introduced that is the difference between market value and capital employed in the company. MVA is a result of present net value of past projects and future profitable opportunities for the company, and shows how the company has successfully applied its capital, has forecasted future opportunities and has planned for achieving them. In theory, a company's MVA is the present value of all economic added value of the company or remaining profits are expected to be created in the future.

Several studies have been conducted to investigate the matter which will be discussed later. Samiloglu and Demirnes (2008) conducted a study on a sample of Turkish manufacturing firms during the period 1998-2007 to examine the relationship between profitability and working capital management. The results showed that the period of receivable accounts, inventory and levers negatively and significantly affect the profitability of the company, while growth (in terms of sales) positively and significantly affects the profitability of the company. However, the cash conversion cycle, size, and financial fixed assets does not have statistically significant effect on the profitability of the companies. The results indicate that profitability of the company increases through the reduction of period of receivable accounts and inventory.

1 - Retained Economic Value Added
2 - Market Value Added
Nazir and Talat (2008) examined the constituent elements of working capital based on a sample of 204 manufacturing companies in 16 industry groups on the Pakistani stock exchange for the period 1998-2006. They considered some internal and external factors including the operating cycle, operating cash flow, leverage, size, and growth as internal factors and the type of industry and level of economic activity as macro-economic factors. The results show that the operating cycle, leverage, ROA and Tobin’s Q are the internal factors that significantly affect working capital requirements, while working capital management practices are dependent on the type of industry, and various industries have different working capital requirements, these results are consistent with previous studies. Nobani and Alhijar (2011) in their study found that cash conversion cycle is a useful way to evaluate a company's cash flow, since it measures the time spent on working capital. Compared to traditional methods of measuring liquidity including current ratio and the quick ratio that solely rely on the balance sheet figures, this method is much stronger and more complex. The cash conversion cycle considers the time aspect of liquidity and evaluates the overall ability of the company in terms of liquidity. Thus, shortening the cash conversion cycle and the period of collection of receivable accounts improve operational cash flow and the company's performance. The results also show that shortening the period of inventory conversion, the company's performance and its cash flow will weaken. These results suggest that shortening the inventory conversion period, managers will have to prevent costs that may damage operating cash flow and the company's performance.

Valipour and Hosseini (2009) in a study of companies listed on Tehran Stock Exchange during the years 2000-2007 found an inverse relationship between stock profitability and working capital policy. Overall results of this study indicate that cash management, receivables management and financing methods have an effect on the liquidity situation, while inventory management is not statistically significant.

### 3. Modeling of research method and results of modeling estimation

The model estimated in this study is as follows.

\[ B_0 + B_1X_{1i,t} + B_2X_{2i,t} + B_3X_{3i,t} + B_4X_{4i,t} + U_{i,t} = EVA_{i,t} \]

Where \( X_1 \) is period of collection of receivables, \( X_2 \) is period of inventory turnover, \( X_3 \) is period of debt repayment and \( X_4 \) is the cash conversion cycle, while \( EVA \) is economic value. Economic value is calculated by multiplying the difference between the rate of return \((r)\) and the rate of cost of capital \((c)\) by the amount of capital employed \((\text{Capital})\). To calculate the economic value added, the following equations can be used:

\[ EVA = (r - c) \times \text{Capital} \]

\[ EVA = \text{NOPAT}_t - (\text{WACC} \times \text{Capital}_t - 1) \]
Where (r) is returns rate, (C) is the rate of cost of capital, (NOPAT) is net operating profit after tax, (WACC) is weighted average cost of capital and (Capital) is capital.

The main objective of this study is to test the following statistical assumptions:
H0: Working capital of business unit does not affect economic value added (EVA).
H1: Working capital of business unit affects economic value added (EVA).

For this purpose, data and information of 127 companies were collected in the period 2009-2012. The model can be estimated using either Pooled or Panel method. To determine this, Limer’s F test is used. The null hypothesis is tested using pooled method. The results indicate that the null hypothesis can be rejected and the model should be estimated using data panel method.

Table 1: Limer’s F Test

<table>
<thead>
<tr>
<th>Test effects</th>
<th>Statistic</th>
<th>d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section F</td>
<td>28.749921</td>
<td>(70, 342)</td>
<td>0.000</td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>808.364377</td>
<td>70</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Now, in the second step, it should be determined which method (fixed effects or random effects) is appropriate to estimate the Panel. For this purpose, Hausman test (1980) is used. In Hausman test, the null hypothesis means that there is no relationship between the disturbing element of the equation and explanatory variables, and in fact they are independent of each other. However, the opposite hypothesis means that there is a correlation between the disturbing element and explanatory variables. Since in case of correlation between the disturbing and explanatory variables, coefficients are biased and inconsistent, if rejecting the null hypothesis, the fixed effects method should be used. The results of this test are given in Table 2. Hausman statistic shows that the final model should be estimated as random effects.

Table 2: Hausman Test

<table>
<thead>
<tr>
<th>Test summary</th>
<th>Chi-Sq. statistic</th>
<th>Chi-Sq. d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.680921</td>
<td>6</td>
<td>0.3514</td>
</tr>
</tbody>
</table>

The results of the random effects panel data is presented in Table 3.

Table 3: The model estimation results

<table>
<thead>
<tr>
<th>variable</th>
<th>coefficient</th>
<th>Std. error</th>
<th>t-statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working capital</td>
<td>-0.074360</td>
<td>0.026929</td>
<td>-2.761284</td>
<td>0.006</td>
</tr>
<tr>
<td>Period of debt repayment</td>
<td>-411.8653</td>
<td>3125.371</td>
<td>-0.131781</td>
<td>0.8952</td>
</tr>
<tr>
<td>Cash conversion cycle</td>
<td>400883.1</td>
<td>68758.09</td>
<td>5.83034</td>
<td>0.000</td>
</tr>
<tr>
<td>Inventory turnover</td>
<td>-419.3018</td>
<td>285.4196</td>
<td>-1.469071</td>
<td>0.1426</td>
</tr>
<tr>
<td>Period of collection of</td>
<td>482.1035</td>
<td>274.3554</td>
<td>1.757223</td>
<td>0.0796</td>
</tr>
<tr>
<td>receivables</td>
<td>α</td>
<td>224131.2</td>
<td>130069</td>
<td>1.723172</td>
</tr>
<tr>
<td>-------------</td>
<td>-----</td>
<td>----------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>R2</td>
<td>0.084984</td>
<td>mean dependent var</td>
<td>71011.82</td>
<td></td>
</tr>
<tr>
<td>adjusted R2</td>
<td>0.071658</td>
<td>S.D. dependent var</td>
<td>488883.3</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>471502.5</td>
<td>Total square</td>
<td>9.16E+13</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>6.377520</td>
<td>Durbin-Watson statistic</td>
<td>1.559745</td>
<td></td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td>0.000002</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the results of the table, in the significant level of $\alpha = 0.05$ and based on the t-test results, the independent variable of working capital has statistically significant negative impact on economic value added. Therefore, there is a significant correlation between working capital and economic value added. According to the results of the initial data analysis and output of the software, it can be concluded that the working capital and cash conversion cycle have impact on economic value added. However, given the significant level achieved variables of period of collection of receivables and repayment of debts and inventory turnover do not have significant effect on the dependent variable (Economic Value Added).

4. Conclusion

In this study, the relationship between the measures of working capital and economic value added (EVA) in the companies listed on the Tehran Stock Exchange is examined. For this purpose, data and information of 127 companies in the period 2009-2012 were collected and the model was estimated using panel data and Eviews7.0 software. First, results of Limer’s F and Hausman tests showed that the research model should be estimated using data panel with random effects. The estimation results showed that independent variables of working capital and cash conversion cycle have statistically significant effect on economic value added, since prob related to their coefficients’ significance is less than 5% significance level. Thus, there is a significant correlation between working capital and cash conversion cycle, and economic value added. But, given the significant level achieved variables of period of collection of receivables and repayment of debts and inventory turnover do not have significant effect on the dependent variable (Economic Value Added).
References


