



THE RELATION BETWEEN CASH CONVERSION CYCLE AND ECONOMIC VALUE ADDED IN COMPANIES LISTED ON TEHRAN'S STOCK EXCHANGE, IRAN

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Abstract:

The present research investigates the effects of cash conversion cycle on economic value added among companies listed on Tehran's stock exchange. The sample of study includes 118 companies. The multivariate-regression method has been used for analysis of research hypotheses. Results indicated that a reverse and statistically significant relationship exists between companies' cash conversion cycle and their economic value added. In other words, by reducing the length of cash conversion cycle within reasonable limits, companies are able to increase their economic value added.

JEL: E22, G32, D21

Keywords: working capital, working capital management, profitability, cash conversion cycle

1. Introduction

For commercial and economic firms, working capital is considered as an important asset which plays a significant role in financial decision making. Quantitative and qualitative development of business operations is followed by qualitative and quantitative development of financial management domain. Resultantly, financial management has been given further complexity. Continuity of activities of economic and commercial firms is highly dependent on short term management of the firm's resources. This is mostly because in a usually one year period, activities are related to

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recognition of working capital and a desired management for the former in a way that, expected results are yielded in addition to a possibility for long-term continuity of activities (Nikoomaram et al. 2009).

Maintaining a desired level of cash, which is a determining element of working capital, is usually aimed at payment of overdue debts, exploitation of random opportunities for investment and achieving access to raw material for production in a way that the firm is able to satisfy customer demands in time. The entire former examples point at importance of working capital. Every decision by managers made in this sector, can have a significant influence on operational efficiency of the firm and resultantly, may change the value of firm and wealth of stakeholders.

The present research tries to answer the question that whether there exists a relationship between cash conversion cycle (CCC) and economic value added (EVA) in companies listed on Tehran's stock exchange or not?

2. Statement of problem

From the financial point of view, cash conversion cycle is an element of working capital and is also considered as one of the most important debates. If the former is managed properly, the firm will be provided with massive benefits. Qualitative and quantitative development of business operations is followed by qualitative and quantitative development of financial management domain. Consequently, more complications have been added to financial management concept. Continuity of activities of firms is highly dependent on short-term management of the firm's resources. This is mostly because operational activities in a usually one year period are related to recognition of working capital and its proper management in a way that ultimately, expected results are yielded and a possibility is provided for long-term continuity of operations and activities (Nikoomaram et al. 2009). In fact, working capital is referred to as investment of the firm on short-term assets including cash, short-term securities, receivable credits and product inventories. Net working capital is defined as working (current) assets minus working (current) debts or liabilities (Dylof, 2003). Working capital management deals with current assets and debts. Working or current assets of a firm constitute a major portion of its' total assets. Excessive amounts of working assets may result in reduction of investment efficiency. However, firms that have low levels of working assets will most probably face insufficiencies and issues regarding normal operation procedures (Rahman et al. 2007).

Managers expect to be able to leave a significant effect on firm's profitability through management of working capital. Therefore, management of working capital is

considered as one of the most important debates in financial management for most companies. In fact, by maintaining an optimal level of working capital, managers are able to increase the value of their firms. Usually, a significant part of every firm's resources is invested on working capital. This in turn, increases the importance of management of working capital. In addition, firms spend their obtained cash on different consumptions. Managers expect to be able to leave a significant effect on their firms' profitability through management of working capital and therefore, for many firms proper management of working capital is an important issue in terms of financial management. Managers are able to increase the value of their firm through maintaining an optimal level of working capital. Usually a significant portion of every firm's resources are invested on working capital. This in turn adds up to the importance and necessity of management of working capital (Mohammadi, 2010).

During operational activities, a firm must be able to maintain a balance between cash and profitability. Cash is a precondition that guarantees that the firm is able to realize the necessities. In fact, it points to a permanent flow in the context of continuity of activities of the firm. Cash and profitability are two important issues which have been frequently regarded by scholars and operatives of financial management. In terms of determination of the place of either of the aforementioned issues, it has been said that if a firm is unable to produce profitability it is ill and if it lacks cash it is dying (Izadinia et al. 2011).

In the view of many academics, there are two main sections that can result in profitability being the capital structure and management of working capital. The former and latter subjects have been subjected to several manipulations with the aim of obtaining profits. Management of working capital is pursued through different means. Among its main components, it can be referred to product inventory management, receivable credits management and payable debts management. In fact several researchers have carried out various researches regarding the aforementioned components in order to investigate their effects on firm's profitability (Dylof, 2003, Quoted by Izadinia et al, 2011).

Management of working capital is defined as policies and decisions that are made in the section of working capital and is aimed at alteration of various types of current assets and sources of short-term financing.

A key index that works well for management of working capital is required for further recognition of this section. The former requirement is fulfilled through selection of cash conversion cycle. Cash conversion cycle or period is consisted of four basic phases of procurement, production, sales and collection of demands. Whenever the firm tries to make use of its commercial credibility for procurement of goods, the cycle starts

and continues as long as it is consistent with others' commercial credibility for sales of goods (Izadinia et al. 2011).

Considering the aforementioned content and with respect to importance of the subject, the present research study tries to propose a new perspective for finding a suitable effect regarding cash conversion cycle and EVA. For the purpose of investigation of the aforementioned relation, cash conversion cycle has been selected as the independent variable and EVA has been selected as the dependent variable. The main purpose of this research is to determine the existence, amount and type of relations between mentioned variables and uses real and historic data of companies listed on Tehran's stock exchange for this purpose.

3. Significance of the research

Nowadays, capital markets have turned into the beating heart of economies of most countries. In fact, these markets work as an economic thermometer and are tasked with collection, equipment and guidance of financial resources in needy sections and suitable markets. Usually a significant portion of every firm's resources is invested on working capital. This in turn adds up to the significance of management of working capital. In addition, companies obtain cash that is spent on different consumptions. For example, having sufficient balance and an open credit policy can have influences on firm's sales income. Maintaining a suitable and sufficient amount of funds balance can reduce the risk of insufficiency of balance at the times of high demands, as well as preventing delays and gaps in production plans. On the other hand, maintaining an excessive amount of cash or giving the customers excessive credits may result in blockage of a large portion of cash in working capital. The aforementioned counts can be investigated under the light of management of working capital. In this research study it has been tried to investigate various aspects of cash conversion cycle and its effects on economic value added (EVA) in firms. The present study is one the very first researches in this context in the country of Iran and resultantly it is worthy of being supported.

4. Review of literature

Valentina Maria et al. (2015) carried out a research and investigated the relationship between efficiency of performance and short-term financial management in small and mid-size European firms. Asset return is used as a proxy for profitability and the cash conversion cycle is used as a proxy for management of working capital. This study has investigated non-financial local firms during the financial years of 2008 until 2013.

Research has shown that a negative statistically significant relationship exists between profitability and each of its determinants such as average collection period, average payment period, average inventory period, cash conversion and profitability cycles.

Niha Duc Bui et al. (2015) carried out a research study and investigated the relationship between management of working capital and firm value. Their research sample included production companies listed on Vietnam's Stock Exchange between the years of 2006 and 2014. They concluded that a nonlinear relationship exists between working capital management and firm value.

Results have also shown a reverse relationship between number of managers and profitability in addition to a positive relationship between cash and profitability. Ashok Kumar (2014) carried out a study on secondary data belonging to a 10 year period of study, made use of several traditional data analysis methods, and analyzed the relationships for investigation of efficiency of management of working capital. The authors of the study concluded that if a firm has a negative working capital, it will have more profitability and resultantly the stakeholders harvest more profits. This in turn, maximizes the value of stakeholders in long term.

Rahman et al. (2007) investigated the relationship between management of working capital and firm's cash level and, firm profitability. This research includes a sample containing data belonging to 94 firms between the financial years of 1999 and 2004. This research has made use of notions including cash conversion cycle, inventory cycle period, debt payment period, demand collection period, working ratio, net operating profit, firm size, debt ratio and ratio of financial assets. This research has made its results based on Pearson's correlation coefficient and regression analysis. Former results have shown that a reverse and statistically significant relationship holds amongst the cycle of cash conversion and its components including inventory cycle period, debt payment period and demand collection period and, firms' profitability. In addition, other results of this research have shown that another reverse significant relationship exists between firms' level of cash, and their debts and profitability. Nonetheless, results of this study have manifested that a direct and statistically significant relationship exists between firm size and profitability.

Another research has been carried out by Lazaridis et al. (2006) in consistence with the research carried out by Mark Dlaf (2003). This research has investigated the data belonging to 131 firms between the years of 2001 and 2004. Results of this research have indicated that a reverse and statistically significant relationship exists between cash conversion cycle and firms' profitability. In fact, it was revealed that managers can maintain a suitable level of cash conversion cycle and its components in order to increase the total firm profitability.

Worthington et al. (2004) compared the data content of EVA for 110 Australian firms between the years of 1992 and 1998. The aforementioned content included remaining profits, operating cash flows and profits before extraordinary items. In this research it was revealed that profits before extraordinary items and EVA are respectively of the strongest and highest relationships with stock returns. Obtained correlation coefficients for variables of EVA, operating cash flow, remaining profits and profits before extraordinary items are respectively equal to 14.29%; 18.1%; 19.29% and 23.67%. In addition, it was revealed that profits before extraordinary items, was of the strongest relationship with returns.

Kesseven Padachi (2004) carried out a study on small production companies in the contexts of 5 industries of food and drinks, house furniture and decoration, clothing, prefabricated products and paper products between the years of 198 and 2003. The research sample of the study was consisted of 58 firms. Results of investigations manifested that excessive investment on inventories and receivable debts result in reduced overall firm profitability. In addition, as cash, profitability and operational performance declines, among the five previously mentioned industries, the industry of paper products developed major changes in management of working capital. In fact, it has been revealed that selecting various technics and methods can have significant effects on firms' overall profitability.

Mark Delof (2003) carried out a research in consistence with the one conducted by Sheen et al. (1998). They investigated the data belonging to 1637 Belgian firms between the years of 1998 and 2003. Sample of this research included 58 firms. The research has made use of notions including cash conversion cycle, credit collection period, inventory cycle period and debt payment period as indexes of working capital management. In addition, the control variables of the study included the ratio between financial assets and total assets, the ratio between financial debts and total debts. Results of this research indicated that a reverse and significant statistical relationship exists between the cycle of cash conversion and its components including credit collection period, inventory cycle period and debt payment period; and profitability.

Fernandez (2003) investigated 583 American companies using data regarding EVA, market value added, net operating profits after taxes and weighted average payment capital. Results for 296 companies indicated that correlation between market value added and net operating profits after taxes is greater than the correlation between market value added economic value added. On this basis, the author concluded that EVA cannot be recognized as the best measurement index for performance and a representative of market value added.

Machuga et al. (2002) investigate the data content of EVA in terms of anticipation of profits per share for a sample including 4382 American firms between the years of 1981 and 1996. Results indicated an increasing information load for EVA and its significant relationship with anticipation of profits per share.

Anand et al. (2002) conducted a study and investigated the performance of management of working capital between the years of 1991 and 2001. The sample of this study included 427 firms. In addition, this research has made use of notions including cash conversion cycle efficiency, cycle of operating period and working capital period in order to evaluate the performance of firms' working capital management. Results of the study indicated that not only the selected criteria are suitable for evaluation of performance of working capital management.

Kramer et al. (2001) investigated the capability of EVA as an index of market value added among 53 American industries. Their research period was between 1978 and 1996. Results of their research indicated that making use of the EVA as an index of market value added has no advantages net operating profits after taxes.

Shine et al. (1998) conducted a study and investigated the efficiency of working capital management. This research has investigated the data belonging to 58985 firms between the years of 1975 and 1994. In this research, net business activity period was selected as the criterion of efficiency of working capital. Results of this research indicated that a reverse and significant statistical relationship exists between cash conversion cycle and profitability. In addition, it was revealed that managers are able to reduce the cash conversion cycle length in order to reasonably increase the profitability of their firm.

Kramer et al. (1997) evaluated the intensity of the correlation between EVA and market value added among 1000 firms between the years of 1982 and 1992. The authors of this study have found out that net operating profits after taxes are able to describe the changes in market deviation more than EVA. In fact, their results indicated that the market is mostly concentrated on profits rather than EVA.

5. Methodology

Since the present research is focused on relations between variables, its methods are correlative. Correlational studies include those in which it is tried to determine the relation between various variables through the application of correlation coefficient methods. This research has made use of the correlation method based on two major reasons: firstly exploration of the correlation between variables and secondly, anticipation of one variable based on one or more than one other variables. On the other

hand, the present research is also considered as an applied research since its results have applications and implications in real world. In fact, the obtained results of this research can be used for anticipation of firms' level of EVA. In addition, since the present study elaborates on data belonging to a specific time period (2011-2015), it is considered as a cross-sectional study. In addition, since the present research is based on real data, it is considered also as an experimental study.

With respect to determined hypotheses, research variables are as follows:

Table1: Research variables

Symbol	Name	Measurement method
performance	profitability	$EVA = (r - c) \times \text{Capital}$
CCC	Cash conversion cycle	Debt payment period - inventory cycle + credit collection period
size	Firm size	Natural logarithm of sum of assets
B_0	Intercept	--
E_t	residuals	--

A. Independent variable

The present research has made use of EVA as the independent research variable. One of the indexes for evaluation of performance of accounting is remaining profit which has been defined as operating profit after deduction of capital expenses. In fact, EVA is an altered version of remaining profits along with adjustments made on profits and capital. The following formula has been used for calculation of EVA:

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

In the upper relation, EVA stands for economic value added, r is the total rate of capital efficiency and c is the rate of capital expense. A financial approach has been used for calculation of EVA through the upper formula. The type of selected approach has impacts on calculation of (r), necessary adjustments for conversion of accounting profits into NOPAT and conversion of rights of stakeholders into capital.

B. Dependent variable

Cash conversion cycle (CCC): it is equal to the time period between cash payments and cash collections of the firm.

C. Control variable

Firm size: firm size shows the volume and extensiveness of activities of a firm. In order to determine a firm's size, we have to make use of notions such as natural logarithm of

book value of entire firm's assets, natural logarithm of book value of gross fixed assets, number of employees, volume of firm's sales and natural logarithm of firm's annual sales. This research has made use of the natural logarithm of book value of firm's entire assets.

6. Population, sample and sample selection method

The population of this research includes the entire firms listed on Tehran's stock exchange between the years of 2011 and 2015. The most important reason for selecting this population is that the data belonging to these firms are reliable, clear and understandable.

Research sample has been selected according to the following criterions:

1. Having entered the stock exchange list prior to 2011
2. Their stocks should be sold at least once a year
3. Not being included as a financial mediator company such as banks
4. Not being included among non-profitting companies

By considering and enforcing the aforementioned conditions, a number of 177 firms have been selected as the sample of study. Five financial years for each firm and a total of 885 observations for the whole research sample have been performed.

7. Data collection and analysis methods

Library studies including several books and articles have been performed for collection of parts of required data for this research. In addition, other required data have been collected from the official stock exchange website and the Software of Rahavard-Novin.

This research has made use of the statistical methods of multivariate regression, student t-test and the F test for investigation of validity of research hypotheses. In addition, it is worth mentioning that the entire statistical operations have been performed within the software of Excel and E-views. The following presents the basics and hypotheses for regression analysis.

7.1 Regression analysis

Since the purpose of this study is to investigate the extent of effects of independent variables on dependent variable and estimation of existing coefficients and providing a suitable model for anticipation, therefore the multivariate regression method has been used for testing hypotheses.

In case the purpose of a research is only investigation of the relation between independent and dependent variables, by calculating a correlation coefficient, one may be able to investigate the extent of dependence of a variable on another. However, this analysis is unable to specify the cause and effect relations that hold among variables.

Correlation coefficient merely described the extent of relatedness between independent and dependent variables. If one aims to investigate the amount of changes of a variable under the effects of another variable, the regression analysis must be used. In addition to determination of the type of correlation, this method also allows us to estimate the coefficients of dependent variables. In addition, through the application of this method, one may be able to signify the extent of effectiveness of a change in each unit of independent variables on dependent variables (Azar et al. 2009).

Regression analysis is almost the most important instrument that has been used by economic researchers. In general, it can be stated that regression is the instrument of evaluation of a relationship that exists between one variable and some other variables. In other words, regression is a tool for explanation of fluctuations of a variable with respect to fluctuations of one or some other variables (Aflatooni, 2014). Regressions can be in either forms of simple and linear or multivariate.

In research projects in which it is tried to provide a model for anticipation, determination of the correlation between the dependent variable and anticipator variables is highly crucial. The method by which anticipator variables are merged is called the multivariate regression method.

7.2 Regression hypotheses

Having certain hypotheses is a precondition for a regression analysis. Five-fold hypotheses of linear regression models indicate that the technic of estimation of minimum normal squares has suitable characteristics based on which the hypotheses related to estimated coefficients can be tested reliably. Hypotheses that should be made for every type regression model include (Badri et al. 2011):

7.3 Average errors is equal to zero

The first classic assumption is that average errors are equal to zero. If we have a fixed phrase in regression, then the mentioned objective is achieved at ease and the assumption is never violated. However, if the regression line had no intercept, then there may be several undesirable consequences. First of all, the R^2 determination coefficient which is defined as RSS/TSS may yield a negative value. This shows that sample average is able to explain the changes in Y more than descriptive variables. The

second and more crucial consequence is that an intercept-free regression relation may result in increased slope for estimated coefficients of regression line.

7.4 Variance of errors is a fixed value

This classic hypothesis indicates that the variance of errors must be constant value. This hypothesis is known as homogeneity of variances. If errors did not have any constant variances, it is said that the errors are non-homogeneous. There are several official statistical tests aimed at investigation of variance homogeneity. One of the simplest of these tests is the Goldfeld-Quandt test. There is also another test for testing the homogeneity of variances which is known as White (1980) test. This test has a limited series of hypotheses and is therefore suitable for cases of non-homogeneity of variances.

7.5 Covariance between error components is zero

The third assumption implies that the covariance between components of error is zero. In other words, this assumption implies that errors are not dependent on each other. In case of homogeneity of errors, it is readily concluded that the errors are correlated in serial orders.

The simplest test has been proposed by Durbin and Watson (1951). This test is a test for first level autocorrelation. In other words, these tests are only used for investigation of the relation between a single error and its own previous value.

Durbin-Watson is a test which only investigates the first level correlation between errors. Therefore, there are several various types of autocorrelation between remaining which cannot be signified by the Durbin-Watson test. In other words, the aforementioned test is not able to recognize serial correlations above level one. Therefore, we need a test which considers for autocorrelation between errors as well as various gaps in a single time period. The Brush and Godfrey's (LM) test is a generalized test which considers for autocorrelation in first level until level r . the null hypothesis in this test is lack of existence of correlation. In this regard, denial of only one of the hypotheses will result in denial of the entire hypotheses. Therefore, is the error of period T is only correlated to one of the values of r in previous period, then the hypotheses of lack of existence of correlation is denied. This test is of a higher generalizability and can be used for a wider range of situations because this method doesn't have the limitations that were found in Durbin-Watson method.

7.6 Error sentences should have a normal distribution

In order to run the mutual or separate hypothesis test regarding regression parameters, the assumption of normality of remaining in small samples is necessary. One of the

most frequently used tests for normality of regression error components is the Jarkko test. Hypotheses in Jarkko test include:

H0: normality

H1: lack of normality

7.7 Explanatory variables are not correlated

One of assumptions which are made during using OLS is that explanatory variables are not dependent on each other. Whenever there is no relation between explanatory variables, it is said that the variable are orthogonal. In this case, adding a new orthogonal explanatory or eliminating one from the model will make no difference in coefficients of other variables.

7.8 Selecting the best estimation method

In terms of economic, we tend to adhere to the saving principle and therefore, we do not tend to prepare a slope coefficient for every firm in each financial year. In fact the aforementioned saving principle is an important scientific principle. In terms of estimation of a model with combined data, first of all the type of the model should be specified. In this regard, firstly we have to specify the best model and afterwards, the selected model should be estimated. For this purpose, the tests of Pagan, Limier and Hausmann will be used. In order to compare the integration model with the fixed effects model, the Limier test will be used. The hypotheses of this test include:

H0: $a_1 = a_2 = a_3 = a_4 = a_5 \rightarrow$ entire intercepts are equal \rightarrow pooled model

H1: $\exists r \neq s \Rightarrow a_r \neq a_s \Leftrightarrow$ at least one of the intercepts is different \Leftrightarrow fixed effect model

$$F = \frac{(R^2_{LSDV} - R^2_{POOLED}) / (T - 1)}{(1 - R^2_{LSDV}) / (NT - T - K)}$$

$$F = \frac{(RSS_{POOLED} - RSS_{LSDV}) / (T - 1)}{RSS_{LSDV} / (NT - T - K)}$$

In these models, R^2_{LSDV} and RSS_{LSDV} are respectively the determination coefficient and sum of remaining squares yielded from the fixed effects model. In addition, R^2_{POOLED} and RSS_{POOLED} are respectively the determination coefficient and sum of remaining squares yielded from the pooled model. N represents the number of intersections (firms) and T represents the length of time (years). If the null hypothesis is declined, then the model will be estimated with the fixed effects methods and if not, the model will be estimated using the Pooled method. In case of selecting the fixed effects model, then the Hausmann test should be used in order to test it:

H0: there is no correlation between individual effects and explanatory variables

H1: there is a correlation between individual effects and explanatory variables

$$H = (\beta_{fem} - \beta_{rem})' (\text{Var} (\beta_{fem}) - \text{Var} (\beta_{rem}))^{-1} (\beta_{fem} - \beta_{rem}) \sim \chi^2$$

In the upper relation B_{FEM} represents slope coefficients for the fixed effects model and B_{REM} represents slope coefficients in random effects model and VAR stands for variance. This statistic has an χ^2 distribution and if the null hypothesis was declined, the model will be estimated based on fixed effects method. Otherwise, the model will be estimated through the random effects method (Aflatooni, 2014).

7.9 R² determination coefficient

We are required to have indexes for evaluation of the precision of data through regression models. There is an index known as fit goodness which is used for evaluation of precision of fitness of data by regression functions. The most well-known goodness of fit index is the determination coefficient (R²). Determination coefficient describes those changes in Y which are determined by the regression equation. Determination coefficient is obtained as follows:

Determination coefficient = $R^2 = \text{ESS}/\text{TSS} = \text{Changes in Y explained by regression equation} / \text{total changes of Y}$

In this regard, R² states the goodness coefficient of the model.

7.10 Significance of the regression equation

Variance analysis shows if the whole regression equation is significant or not. In other words, if the changes explained by explanatory variables are significant compared to changes unexplained. For this purpose, the following hypothesis must be tested:

H0: $B_1 = B_2 = \dots = B_k = 0$

H1: $\exists \beta_i \neq 0 \quad i=1, 2, \dots, K$

In addition, the statistic of F test is calculated as follows:

$$F = \frac{\text{SE}_2}{\text{SR}_2} = \frac{\text{SE}_2}{\sigma^2} = \frac{\text{ESS}/(k-1)}{\text{RSS}/(n-1)} = \frac{n-k}{k-1} \frac{\text{ESS}}{\text{RSS}} = \frac{n-k}{k-1} \frac{R^2}{1-R^2}$$

Whenever the value of F was larger than its critical value, it means that H0 hypothesis will be denied and that the regression is significant. It is clear that as the R² gets larger, F will become larger as well (Mohammadi et al. 2013).

7.11 Testing the significance of coefficients

In order to test the significance of each regression estimated coefficient, it will be assumed that the regression coefficient is equal to zero. In other words, the independent variable has no effects on the dependent variable. In other words, null hypothesis will be stated as follows:

$$B_i = 0: H_0$$

In contrast, the contrary hypothesis states that the independent variable is effective on the changes in dependent variable. In other words:

$$\beta_i \neq 0: H_1$$

In order to test these hypotheses, the student t-test is used at significance level of 5%. If the obtained absolute value (modulus) for t is larger than the t value obtained from the table, then the H₀ hypothesis will be denied. In this test, denial of the H₀ means that the coefficients under investigation are significant and vice versa (Mohammadi et al. 2013).

8. Results

8.1 Descriptive statistics

Descriptive statistics include a set of methods used for processing of data. The descriptive statistics regarding the present research are shown in figure 4. Descriptive Statistical Quantities include average, midpoint, maximum, minimum, standard deviation, skewedness and elongation. In fact, data analyses are performed using the aforementioned data indexes. With considering the aforementioned criteria, this research includes a sample of 177 companies listed on Tehran's stock exchange between the years of 2011 and 2015.

Table 2: Central and dispersal indexes of research variables

	PER	CCC	Size
Average	-1.333.443	264.9980	11.97995
Midpoint	-1.394215	256.2050	11.90135
Maximum	3.492570	917.926	14.22362
Minimum	-7.537340	-10.1291	10.55868
S.D	1.464612	210.6510	0.630314
Skewedness	0.056652	0.24133	0.878567
Elongation	4.125099	2.517267	4.132741

8.2 Inferential statistics

After investigation of regression hypotheses and selecting the best model, we try to estimate the regression and test the research hypotheses.

Table 3: Regression analysis

Variables	Coefficients	T statistic	Sig.
Fixed component	3.925688	35.92368	0.000
CCC	-0.000265	-2.901903	0.0039
Size	0.022791	2.521524	0.0120
Dependent variable: PER3			
Determination coefficient			0.9.9464
Adjusted determination coefficient			0.9.9353
F statistic			9017.142
F statistic's probability			0.000000
Durbin-Watson			1.586895

Cash conversion cycle has a negative and statistically significant effect on EVA

H0: there exist no significant relation between CCC and EVA

H1: there exists a significant relation between CCC and EVA

Data regarding estimation of the regression model for testing the main research hypothesis show that a negative and statistically significant relationship holds amongst the independent and dependent variables. In addition, another significant relationship was detected between firm size and the dependent variable. The adjusted determination coefficient obtained for this model is equal to 0.90 and this value states that approximately, 90% of the changes in dependent variable are anticipated and explained by the independent and control variables. In addition, it can be seen in above tables that the Durbin-Watson statistic is equal to 1.58. This statistic should be between 1.5 and 3.5. Results show that the third main hypothesis stating a significant relationship between CCC and EVA is accepted.

As it was expected, companies that have a shorter credit collection period, have higher profitability. Since a shorter CCC results in higher cash and more profitability and overall firm value, therefore the present research is in consistence with these results.

9. Conclusion

Mark Delof (2003), Lazaridis et al. (2006) and Rahman et al. (2007) have investigated the effects of management of working capital on profitability in firms. Results of these

researches indicated that a negative and statistically significant relationship exists between CCC and its components including credit collection period, inventory cycle period and debt payment period are reversely associated with profitability. These results are consistent with the results obtained by the present study.

10. Recommendations

With respect to existence of a negative relationship between cash conversion cycle and economic value added, in order to increase their EVA, companies and firms are recommended to reduce the length of period of collection of receivable accounts as much as possible.

11. Suggestion for future studies

Considering the literature of the subject matter, the following are recommended in order to clarify the effective elements on EVA:

1. Future researchers are recommended to consider gross national production as an index of economic performance for identification of effect of economic performance on market value added. In this regard, the share of performance of management is separated from the share of performance of economy in terms of determination of market value added.
2. In addition, future researchers are recommended to investigate the relationship between market value added and other traditional indices of accounting including free cash flows, operating benefits after taxes and operating cash flows and ordinary ratios related to balance sheets. In addition the relation between financial ratios and EVA among companies listed on Tehran's stock exchange is also worthy of investigation.

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