The effect of intellectual capital on traditional and modern indicators of liquidity in companies Listed on the Tehran Stock Exchange

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Abstract: Background and Aim: The present study examines the effect of intellectual capital on traditional and modern liquidity indicators in companies Listed on the Tehran Stock Exchange". This issue has been tested by examining the impact of intellectual capital, including human capital, structural capital, and physical capital, as independent variables on traditional and modern liquidity indices and liquidity ratios based on cash flow as a dependent variable. Research method: The statistical sample of the research is all companies listed on the stock exchange from 2009 to 2014, which have the conditions set for the statistical sample. Therefore, 142 companies were studied. In order to test the hypotheses, linear regression tests and Pearson tests were used. Findings and Conclusion: Based on the results of statistical tests, at a 95% confidence level, there is a significant relationship between intellectual capital based on the Palik model and traditional and modern liquidity indicators of the studied companies. In general, the research findings are consistent with the results of other research on intellectual capital. In other words, this study also indicates a significant effect of intellectual capital on the evaluation indicators of companies.

Keywords: Intellectual Capital, Liquidity Indicators, Tehran Stock Exchange.

Introduction

Until the 1980s, business unit management considered the work environment and industry structure to understand the competitive advantage. During this period, the role of management was only to find a way to optimally combine products and target markets and remove barriers to the entry of goods into these markets. During the 1980s, the focus on the work and industry environment faced many challenges. In this period, by examining some facts, it was proved that competitive advantage could not be achieved only by optimally combining products and target markets in a particular industry; Rather, the main reason for competitive advantage is the difference in different types of organizational resources (Anvari Rostami & Rostami, 2003).

Since then, the management of for-profit units has shifted to internal resources rather than the environment and industry. Non-objective resources also referred to as knowledge, intangible assets, strategic assets, etc., are the most

important resources within the organization that are eligible to create and increase sustainable competitive advantage. Coinciding with the information technology revolution and the rapid development of superior technology, the pattern of economic growth underwent fundamental changes in the 1990s. As a result, the knowledge factor replaced the financial and physical assets in the global economy as the most critical asset. In other words, industrial economics gave way to knowledge-based economics. In industrial economics, the main factors for the production of economic wealth are physical and tangible assets such as land, labor, money, and machinery, and it is the combination of these factors that ultimately leads to the production of wealth. In this type of economy, knowledge plays a minor role as the critical factor in creating value and wealth (Mojtahedzadeh, 2002).

In a knowledge-based economy, knowledge and intellectual capital as a significant factor in wealth production are more important than tangible and physical assets. In the current competitive markets, where the goal of organizations is to gain more market share by creating competitive advantages, the success of an organization depends on the application and management of the element of knowledge and intellectual capital in all organizational dimensions (Bonits, 1998).

Today, despite the increasing importance of intangible assets and intellectual capital in companies, most traditional accounting systems cannot measure the intellectual capital of companies and its reflection in financial statements. In contrast, the role and importance of intellectual capital are used sustainably. Companies are used more than financial capital. Meanwhile, the new world economy has played an undeniable role in significantly increasing the importance of intellectual capital in development and progress. In a knowledge-based economy, intellectual capital is used to create and increase organizational value, and the success of an organization depends on the ability of that organization to manage these scarce and valuable resources. Due to the colorful role of intellectual capital in increasing the share of companies in global markets, sustainable profitability, and ultimately increasing the wealth of shareholders, as well as considering the complexities of the current global trade environment, investors, creditors, and other users groups can increase Consider as an indicator to evaluate the current performance and status of business units, as well as future forecasts. For these and many other reasons, it is necessary to conduct extensive and in-depth research on various dimensions of intellectual capital, including the concept of intellectual capital, to study different methods of evaluating and reporting it and how intellectual capital relates to other concepts of accounting, management, and economics (Caranbach, 2005).

The main question of this study is the effect of intellectual capital on traditional and modern liquidity indices in companies listed on the Tehran Stock Exchange.

The concept of intellectual capital

In recent years, many efforts have been made by researchers, organizations, and authorities in economics, accounting, and management to provide a comprehensive definition of intellectual capital. Before presenting any definition of intellectual capital, it is necessary to explain the differences between the concept of intellectual capital and intangible assets. There are differences between intellectual capital and intangible assets. These discrepancies result from a perspective adopted from Mertium guidelines for the management and reporting of intangible assets.

There is generally no uniform definition of intangible assets, and they are usually defined as intellectual capital. The best definition for intangible assets is: Money lacks the physical nature of being educated for use in the production of goods, the provision of services, rent to others, or for administrative purposes. These assets are identifiable and can be controlled by the for-profit unit due to past events and have future economic benefits. In simpler terms, intangible assets are those assets that are recognized as financial assets by financial accounting standards and are reflected in the balance sheet. Examples include trademarks, patents, patents and services, copyrights, and goodwill (Chen et al., 2004).

Many researchers and scientists in management, economics, and accounting have researched intellectual capital and its various dimensions and have provided various definitions of intellectual capital. In general, it can be said that intellectual capital includes all processes and assets that are not normally and traditionally reflected in the balance sheet. It also includes those groups of intangible assets, such as trademarks and royalties, etc., that modern accounting methods consider (Edvinsson & Malone, 1997).

- Human capital: represents the inventory of knowledge of individuals in an organization. Human capital includes a set of knowledge, merit, and competence, the spirit of cooperation, employee flexibility, adversity tolerance, motivation, job satisfaction, leadership style, problem-solving ability, risk-taking, experience, skill, and talent of people within an organization. Human capital also includes the power of innovation and creativity of the organization (FASB).

- Structural capital: includes all non-human reserves of knowledge in the organization. Structural capital includes strategic plans, visions, organizational processes, core values, and knowledge embedded in organizational structures, processes, and culture. (Faster, 2000).

- Communication capital: Communication capital is considered a set of factors that organize and manage the organization's relations with its environment. Communication capital includes customer relations and marketing, external relations with networks, business competitors, suppliers of raw materials, partners and shareholders of the excellent reputation of the for-profit unit, business associations and guilds, government, government-affiliated institutions, media, and research centers (Starovic & Marr, 2003).

Liquidity: The ability of a company to meet short-term commitments. In other words, it is the relationship between the cash that will be provided to the company in the short term and the cash that the company will need (Stewart, 1997).

Capital Acquisition Ratio: Capital Acquisition Ratio expresses the ability of companies to finance capital expenditures from within the institution.

The ratio of investment to financing: The net internal relationship between operating flows and investment and financing cash flows can indicate how investments are financed. The ratio of investment to financing compares all the financial resources needed for investment with the sources of financing.

- Cash conversion cycle: The cash conversion cycle is vital for working capital management. The cash conversion cycle is the net period between payment of debts and receipt of cash from the place of receipt of receivables. The shorter the period, the better liquidity the company has.

- The net cash balance index is another new index that has been introduced to determine the liquidity status of companies. In this index, to show the liquidity status of the company, attention is paid to cash balances and securities. This index shows the company's real liquidity reserves concerning unforeseen needs (Sveiby, 1997).

Research Methods

The statistical population of this study includes all companies listed on the Tehran Stock Exchange whose shares were traded in the period 2009 to 2014. In order to relatively match the activities of statistical companies, companies with the nature of the industry of banks, credit institutions, and other monetary institutions, financial intermediation, and financial investments were removed from the companies of the statistical community.

1. The end of their fiscal year should be the end of March, and they should not change the fiscal year during the research period.

2. In the banking industry, credit institutions and other monetary institutions are not financial intermediaries and financial investments.

3. Do not have a trading interval of more than three months.

4. The financial information required for the research in the course must be provided to the Securities Exchange Organization.

By the end of the research area, 483 companies had been listed on the stock exchange. Then, according to the conditions set for the members of the statistical community of the research, 341 were eliminated, and finally, 142 companies in the form of 18 different industries remained as members of the statistical community.

This research is done at a 95% confidence level. At the 95% confidence level, we confirm or reject the hypotheses.

Findings

Test the first hypothesis
A) Statistical hypothesis:
There is a significant relationship between the value-added of the intellectual capital and the current ratio.

Hypothesis H0: There is no significant relationship between the value-added coefficient of intellectual capital and the current ratio.

Hypothesis H1: There is a significant relationship between the value-added coefficient of intellectual capital and the current ratio.

B) Test statistics:

$$H_0 : \rho = 0$$

$$H_1 : \rho \neq 0$$

Table 1. Correlation coefficient, determination coefficient, and Durbin–Watson test of intellectual capital variable and a current ratio

Durbin - Watson	Modified coefficient of determination	Determination coefficient	Correlation coefficient
1.745	0.471	0.474	0.689

According to Table 1, the Pearson correlation coefficient between variables is 0.689. This number indicates a relatively high and positive correlation between the two variables. Also, the adjustment coefficient

The calculated figure also shows the number 0.471, which indicates that about 47% of the changes in the current ratio variable are explained by the variables of value-added intellectual capital, company size, growth, and financial leverage. One of the regression assumptions is the independence of errors; Regression cannot be used if the error hypothesis is rejected and the errors are correlated with each other. Durbin-Watson statistics are used to check the independence of errors. If the value of Durbin–Watson statistics is in the range of 1.5 to 2.5, the assumption of no correlation between errors is confirmed, and regression can be used. According to the table above, the Watson Durbin statistic value is 1.745, and this number shows that there is no correlation between the data and the errors are independent of each other, and the regression model can be used.

Table 2. Regression analysis of variance (ANOVA) of intellectual capital variable and a current ratio

	Model	sum of squares	degree of freedom	mean squares	F	Sig.
H1	Regression	259.748	3	86.563	683.073	0.000
	residual	107.361	847	0.127		
	Sum	367.109	850			

According to the output of the above table, the significance of the whole regression model is tested by the ANOVA table through the following statistical hypotheses:

H0= There is no linear relationship between the two variables

H1 = There is a linear relationship between the two variables

Considering that sig is less than 5% and the value of statistics, the null hypothesis is rejected, and the significance of the regression model is accepted at a 95% confidence level. Now we are looking to find this relationship:

Table 3. Regression equation (Coefficients) variables of intellectual capital and a current ratio

	model	Unstandardized coefficients		Standardized coefficients	multicollinearity test	
		Beta	Standard error	Beta	T	Si.g
H1	Intercept	0.299	0.031	-	9.459	0.000
	VAIC	0.452	0.021	0.824	42.674	0.001
	SIZE	0.010	0.000	0.138	7.489	0.000
	LEV	0.060	0.010	0.107	5.793	0.000

The table above shows the partial regression coefficients. In the output of Table 4-5, the beta column presents the constant values and coefficients of the independent and control variables, respectively.

Now, if α and β are the constant value and the slope of the community regression line, respectively, the test of hypotheses for these two values can be written as follows:

$$\begin{cases} H_\cdot : \beta = \cdot \\ H_\backslash : \beta \neq \cdot \end{cases} \text{ and } \begin{cases} H_\cdot : \alpha = \cdot \\ H_\backslash : \alpha \neq \cdot \end{cases}$$

In this output, the significance level of the constant value and the independent variables is less than 5%, which results in the null hypothesis being rejected and the opposite hypothesis confirmed. Thus the constant-coefficient and all independent variables remain in the regression equation.

Therefore, the regression model resulting from the test results is as follows:

LnCR = 0.299 + 0.452 VAIC + 0.010 Size + 0.060 LEV + ei

Also, the results of examining the normality of the statistical distribution of error components (residual) of the regression model using the Kolmogorov-Smirnov test are as follows: Table 4-6:

Table 4: Investigation of the normality of the residual distribution of the regression model using the Kolmogorov-Smirnov test

Table 4. Investigation of the normality of the residual distribution of the regression model

Variable	Number	Kolmogorov-Smirnoff Statistics	P	Result
RESFARZ1	852	1.125	0.281	**Normal**

Since the level of significance (sig) of Kolmogorov-Smirnov test results is more than 5%, the normality of the statistical distribution of the remaining components of the regression model is confirmed.

According to the results of the tests related to the first hypothesis of the research, the null hypothesis is rejected, and the opposite hypothesis is confirmed. Therefore:

There is a significant relationship between the value-added of the intellectual capital and the current ratio.

Test the second hypothesis

A) Statistical hypothesis:

There is a significant relationship between the value-added coefficient of intellectual capital and the current ratio.

H0: There is no significant relationship between the value-added coefficient of intellectual capital and the current ratio.

H1: There is a significant relationship between the value-added coefficient of intellectual capital and the current ratio.

$$H_0 : \rho = 0$$

$$H_1 : \rho \neq 0$$

B) Test statistics:

Table 5. Correlation coefficient, coefficient of determination, and Durbin–Watson test of intellectual capital variable and a current ratio

Correlation coefficient	Determination coefficient	Modified coefficient of determination	Durbin - Watson
0.568	0.322	0.318	2.245

Table 4-7 shows that the Pearson correlation coefficient between variables is 0.568. This number indicates a high and positive correlation between the two variables. Also, the calculated adjusted coefficient of determination shows the number 0.322, which indicates that about 32% of the changes in the current ratio variable are explained by the variables of value-added intellectual capital, company size, growth, and financial leverage. Be. One of the regression assumptions is the independence of errors; Regression cannot be used if the error hypothesis is rejected and the errors are correlated with each other. Durbin-Watson statistics are used to check the independence of errors from each other. If the value of Durbin–Watson statistics is in the range of 1.5 to 2.5, the assumption of no autocorrelation between errors is confirmed, and regression can be used. Watson's Durbin statistic value is 2.245

according to the table above, and this number shows that there is no correlation between the data and the errors are independent of each other, and the regression model can be used.

Table 6. Regression analysis of variance (ANOVA) of intellectual capital variable and a current ratio

	Model	sum of squares	degree of freedom	mean squares	F	Sig.
H2	**Regression**	243.125	3	81.041	675.341	0.000
	Residual	102.125	847	0.120		
	Sum	345.25	850			

According to the output of the above table, the significance of the whole regression model is tested by the ANOVA table through the following statistical hypotheses:

H = 0 There is no linear relationship between the two variables

H1 There is a linear relationship between the two variables

Given that sig is less than 5% and also considering

In terms of statistics, the null hypothesis and the significance of the regression model are accepted at the 95% confidence level. Now we are looking to find this relationship:

Table 7. Coefficients of intellectual capital and a current ratio

	model	Unstandardized coefficients		Standardized coefficients	multicollinearity test	
		Beta	**Standard error**	**Beta**	**T**	**Si.g**
H2	**Intercept**	1.402	0.135	-	9.147	0.000
	VAIC	0.315	0.001	0.162	3.958	0.001
	SIZE	0.045-	0.025	0.052-	1.265-	0.212
	LEV	0.232-	0.058	0.410-	9.925-	0.000

The table above shows the partial regression coefficients. In the output of Table 4-9, the beta column presents the constant values and coefficients of the independent and control variables, respectively.

Now, if and are the constant value and the slope of the community regression line, respectively, the test of hypotheses for these two values can be written as follows:

$$\begin{cases} H_\circ: \beta = \cdot \\ H_\backslash: \beta \neq \cdot \end{cases} \quad \text{And} \quad \begin{cases} H_\circ: \alpha = \cdot \\ H_\backslash: \alpha \neq \cdot \end{cases}$$

In this output, the significance level of the constant and variable amount of intellectual capital and financial leverage as an independent variable is less than 5%, which as a result, the null hypothesis is rejected, and the opposite hypothesis is confirmed. Thus the constant coefficient, the variable of intellectual capital, and financial leverage remain in the regression equation.

Also, the significance level of the firm size variable as a control variable is more than 5%, which confirms the null hypothesis. Therefore, the firm size control variable is removed from the regression equation. Therefore, the regression model resulting from the test results is as follows:

LNQR = 1.402 + 0.315 VAIC - 0.232 LEV + ei

Also, the results of examining the normality of the statistical distribution of error components (residual) of the regression model using the Kolmogorov-Smirnov test are as described in Table 4-10:

Table 8: Investigation of the normality of the residual distribution of the regression model using the Kolmogorov-Smirnov test

Table 8. Investigation of the normality of the residual distribution of the regression model

Variable	Number	Kolmogorov-Smirnoff Statistics	P	Result
RESFARZ2	852	1.245	0.093	**Normal**

Since the level of significance (sig) of Kolmogorov-Smirnov test results is more than 5%, the normality of the statistical distribution of the remaining components of the regression model is confirmed.

According to the results of the tests related to the second hypothesis of the research, the null hypothesis is rejected, and the opposite hypothesis is confirmed. Therefore:

There is a significant relationship between the value-added coefficient of intellectual capital and the current ratio.

Conclusion

This study was conducted to investigate the effect of intellectual capital on traditional and modern liquidity indicators in companies listed on the Tehran Stock Exchange. Many researchers in describing the characteristics of the new economic space believe that the form of the economy has taken on a global and pervasive form and is formed from intangible, complex, and intangible assets and incomes, which are significantly intertwined. According to this definition, it is clear that the management, planning, and monitoring of identification of the intellectual capital of firms, is an essential indicator in determining the competitiveness of firms in increasing the share of companies in global markets, sustainable profitability, increasing shareholder wealth and Ultimately, survival in a knowledge-based economy. In the knowledge-based economy, intellectual capital is used to create and increase organizational value, and intellectual capital has become more preferred as a factor of wealth production than other physical assets. Observing and examining the existing factors in companies that in recent years have been able to go through the transition from a traditional economy to a knowledge-based economy to health and ensure the continuity of their activities more than before; shows that the management and optimal use of organizational intellectual capital is the essential factor in achieving such goals.

On the other hand, reviewing the results of foreign and domestic research on intellectual capital and its impact on the performance of companies mainly indicates the significant and direct impact of intellectual capital components on variables such as growth indices, value-added, shareholder wealth, and continuity. It is the activity of companies. The results obtained from this study indicate a significant effect of intellectual capital on traditional and modern indicators of liquidity and ratios based on the cash flow statement; To a large extent, in line with the realities of the business environment in the knowledge-based economy, as well as the results of research related to the importance and function of intellectual capital in improving organizational performance and research in the field of factors and variables affecting company performance evaluation.

Testing the first hypothesis of the research examined the relationship between the value-added coefficient of intellectual capital and the current ratio. The results of the tests indicate that the regression model is significant. On the other hand, the results of measuring the linkage of the research model, which was done using the Pearson correlation test, indicate that the measurement error is low, and there is a positive and relatively high correlation between the value-added coefficient of intellectual capital and the current ratio in the studied companies. Moreover, with the increase of the value-added coefficient of intellectual capital, the current ratio increases. In other words, with the synergy of the components of intellectual capital and increasing the value-added of intellectual capital in the form of human, structural and physical capital, the current ratio of companies and, as a result, the power to settle current debts from current assets increases. Find.

According to these results, it can be said:

There is a significant relationship between the value-added of the intellectual capital and the current ratio.

Testing the second hypothesis of the research examined the relationship between the value-added coefficient of intellectual capital and the current ratio. The results of the tests indicate that the regression model is significant. On the other hand, the results of measuring the linkage of the research model, which was done using the Pearson correlation test, indicate that the measurement error is low, and there is a positive and relatively high correlation between the value-added of intellectual capital and the current ratio in the studied companies.

Exists, and as the value-added coefficient of intellectual capital increases, the current ratio increases. In other words, by synergizing the components of intellectual capital and increasing the value-added of intellectual capital in the form of human, structural and physical capital, the quick ratio of companies and thus the power to settle current debts from current assets except for inventories Commodity increases.

According to these results, it can be said:

There is a significant relationship between the value-added coefficient of intellectual capital and the current ratio.

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