

# The Impact of Intellectual Capital Performance on the Profitability of Companies: Evidence from Tehran Stock Exchange

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**Keywords:** Intellectual capital, human capital, structural capital, physical capital, profitability.

**ABSTRACT** The aim of this study was to test the relationship between intellectual capital efficiency and profitability is. In this context, the performance of companies using intellectual capital, intellectual capital developed Pulic value is calculated. The impact on corporate profitability (net income, return on equity, return on assets and earnings per share) using panel data regression was assessed. Four years of data (2007-2010) Tehran Stock Exchange 100 member companies (458 companies - years) from they sometimes provide audited financial forms were obtained to calculate human capital, structural capital and physical capital was used. Evidence shows the state if the intellectual capital calculation, positive relationship with the company's profitability. The findings of multivariate regression analysis showed a significant role in explaining each of the components of intellectual capital to profitable companies. In particular, structural capital, intellectual capital as a key part, has had the greatest impact on profitability. Physical capital has a positive relationship with all four indicators of profitability is optional. The results will help to understand the role of intellectual capital to create value in companies and special incentives that intellectual capital Profitability impact is detected.

## 1. INTRODUCTION

Rapid changes in today's world, organizations are faced with many methods have been buried. But the organizations that are successful with the help of modern tools of management and technology teeth sometimes provide the opportunity Created to their advantage. Indispensable role today in modern economic science, business and management processes play an effective role, the growing importance of intellectual capital in their organizations is more and more evident. The best tools of economics knowledge and intellectual capital of an organization called it is a most basic asset (Chen, 2005). However, the inability of traditional systems of accounting and financial management in measuring intellectual capital company and subsequently ignore the importance of knowledge in this process, the most important problems of traditional accounting systems. Most of these systems and the growing importance of the role of intellectual property rights and know-how in the organization of a new era of neglect and final Measure the true value of the company's own calculations fail teeth. However, it is important to increase shareholder wealth, business, sustainable profitability; increasing share of the financial markets, evaluating current performance of the business, as well as anticipated future have been considered (De Wet, H. Hall. 2004). The resource-based view, the company's resources as the most important driver of competition and performance is considered. These resources have visible teeth and intangible assets created within the company that the most effective and efficient way to implement specific strategies used profitable and competitive. Intangible factors as the main element in the development of knowledge-based economy, the ability of the company to give strategic plans (Riahi Belkaoui, 2003). Intellectual capital is considered by many defined, but understood by few and actually officially valued by anyone yet. (Stewart, 1991). Increase compared with the total value of the company's intangible teeth only during the growing difference between the book value and market value of corporate intellectual capital to pay attention to it. However, in the last assessment in evaluating the performance of companies with financial indicators and evaluation of financial and tangible assets would be an institution. Today, more evaluations to the evaluation of intangible assets have become

a trend. Whig in 1999 argued that the key to competitive advantage and intellectual capital is the foundation of modern heroic roles. (Zack, 1997). Stewart also human capital is the most important asset of the company. He believes now that the intellectual and human capital higher financial performance, they also will be high. (Stewart, 1991). Documentation to express the problems with these assumptions, this study was to study the relationship between corporate performance and IC them. The importance and necessity of the study of the importance of the little-known categories, The true value of their business and consequently the success and failure in today's complex and competitive environment. The history and background of the study is discussed in the literature, to provide the theoretical framework of the research, the definition of intellectual capital, intellectual capital measurement models and components will be discussed. After that, the hypothesis of the study and statistical methods used to test hypotheses are followed. Following the results of the analysis and the conclusions and recommendations at the end of the investigation will be provided.

## 2. RESEARCH HISTORY

In 1969, Mr. John Galbraith, who first used the term intellectual capital. But in the mid-1980s, moving from the industrial age to the information age began serious and deep gap between the book value and the market value of companies came into existence. In late 1980 the first efforts to develop the financial statement accounts that were used to measure intellectual capital, and books on this subject, such as asset management knowledge was compiled. In the early 90s, the concept of a balanced assessment approach was introduced by Kaplan and Norton and journal articles on the subject were published fourchon. In the middle of this decade Scandia company released the first report on intellectual capital. In the early 2000s, the first magazine with a focus on intellectual capital and intellectual capital as well as the standards published by the Danish government. In the past 10 years more than 7,000 scientific articles in prestigious scientific journals and conferences on intellectual capital have been published. Each specific angle, the question has been examined in the research indicates that the intellectual capital of the organization is effective in improving performance. The effects of the economic value of intellectual capital on the market value of the companies examined. The results of multiple regression analysis showed a positive relationship between these two variables. Huang Chen and Wang Tung Tai and his research as a new model based on linguistic evaluation of intellectual capital a new model for evaluating the performance of intellectual capital by combining fuzzy approach (2- tuple) by decision multivariate techniques tested Taiwanese companies. The results showed a significant relationship between intellectual capital components of the company's performance. Bontis exploratory studies on the relationship between intellectual capital and Investment Company on its business performance indicate a causal link between the significant and important aspects of intellectual capital and business performance there. In a study of the relationship between intellectual capitals efficiently Plowman and Hancock have studied corporate finance. The results show that, firstly, between intellectual capital and financial performance of current and future Companies positive relationship there, and secondly, the impact of intellectual capital in the financial performance of companies in different industries. Garcia and Martinez in a study to examine the relationship between intellectual capital information used in decision Spanish companies have investments in. Helena and Mihalic Tanja. in his research on the effects of intellectual capital components of financial performance presented in the hospitality industry. The results showed a significant relationship between intellectual capital components of financial performance in the industry there. The greatest impact has been communication between the capitals. Chen and his colleagues in the four areas of human capital, intellectual capital, customer capital, capital, innovation and capital structure were studied. They represent the human capital competence, thinking, creativity and skills of employees, capital structure represents information systems, organizational culture and processes of operating and capital innovation success reflects the innovation, mechanism innovation and a culture of innovation. Customer capital represents current knowledge of marketing channels, as well as an organization. Bontis and service industries and service partners in Malaysia conducted research

results showed that among the components of intellectual capital are interacting. This investment is relatively modest effect on business performance and is about 20 to 30 percent. Bontis also did research in Canada survey results also showed that the components of intellectual capital mutual relations there and all 3 components of intellectual capital on corporate performance have affected. multiplier effect on the value of IC industry, bank and insurance stock prices Stock Exchange of Thailand investigated. His study showed that the intellectual capital company with its stock price increase there is a significant relationship.

### 3. LITERATURE REVIEW

In today's world economy is improving, mainly due to the increase in interest resulting undergone knowledge is intellectual capital. one of the benefits of intellectual capital for researchers and practitioners, its use as a tool to determine the value of the entity. Chou Since reporting and management systems lack the ability to implement the necessary information to manage current processes are based on knowledge and intangible resources. This information is increasingly are losing their relevance features. (Edvinsson. & Malone, 1997). In today's knowledge-based societies, the role of financial investors in determining the ability of sustained profitability has been significantly reduced in comparison with intellectual capital. For example, in 1982, of a \$ 100 investment in the shares of manufacturing companies in America, 62 percent of this investment was spent on tangible assets. Large shares of the market value of the tangible assets were in companies but in 2000 that figure was 16 percent. This means that about 84% of the market value of companies accounted for intellectual capital. (Chen, Lin, Hsiao, Thomas, 2008). Shares of these companies are lower. (Bramhandkar , Erickson & Applebee,2007). This is more important when it finds that a company has sold 4 or 5 times the value of its assets. Additional amount paid by the value of intellectual capital, such as human capital, structural issues such as the Community trade mark and while most of the time these assets are not reflected in the financial statements. The research literatures on the concept, nature and methods of measuring and reporting intellectual capital and its relationship to corporate performance many articles have been published. Peter Drucker believes that the society changed its intangible assets. Process he creates a society in which the most important source of knowledge. In the knowledge-based society, not by the value of the allocation of capital and labor, but is created by innovation. (Anghel, 2008). Brookings defines intellectual capital as an intangible asset mix, which led to the building of the company will be, will become. He believes that the human capital of an organization, including the skills, expertise, problem-solving ability and leadership styles (Brooking ,1997). Stuart human capital as the most important asset of the company and believes that intellectual capital consists of knowledge, information, intellectual property and experience that can be effective in creating wealth (Stewart, 1991). From the perspective of Russian and partners, processes and intellectual capital includes all assets that are not shown on the balance sheet. It also includes all intangible assets that are considered modern accounting methods do not create value. In other words, the intellectual capital of an organization is to gather knowledge and using that knowledge will be, will become. (Roos, Et al 1997). Intellectual capital is created internally in the organization. The company lies in the skills and experiences of employees have, because of this special feature, this exclusive property is unique and cannot be copied or imitated. That's why companies are invaluable and can create competitive advantage for the company. (Wiig, M.K). It seems to accept that the values of indicators of financial performance are merely the result of financial and physical capital is not the first time. But also by intangible factors such as intellectual capital is usually not included in reported financial methods. According to the literature study, the main issue of this study is to determine the role and importance of intellectual capital firms in Tehran Stock Exchange. The main research question thus arises whether the intellectual capital in explaining it is a net profit firms involved in Tehran Stock Exchange?

### 3.1. Components of intellectual capital

The elements of intellectual capital and its components, and models comments have been presented by the scientists. It seems that the intellectual capital literature review, most existing models have attempted to three components of intellectual capital with some common features to consider: Human Capital: Human capital is a combination of knowledge, skills, innovation ability, the ability of employees to perform their duties, values, culture and philosophy of the company. Human capital and intellectual capital essential foundation for the realization of the intellectual capital inhibits definition. (Chen, 2005). Capital structure, capital structure and Malone Edvinsson as hardware, software, databases, Organizational structure, organization exclusive rights, trademarks and all organizations that support the ability to define employee productivity. Capital structure is everything when employees go home remain in the company (Edvinsson & Malone, 1997). Customer funds: customer funds as a bridge and catalyst activity is intellectual capital (Stewart, 1991). The main requirements for determining the market value and thus become the intellectual capital of the company's business performance. Customer capital is one of the main components of intellectual capital is the value of marketing and communication channels with leaders of industry and trade, it is. New definitions of capital assets related to customer relationships have developed, including knowledge of the company with customers, competitors, suppliers and governmental factors. (Bontis et al, 2000).

### 4. DATA AND METHODOLOGY

The main objective of this study was to assess the intellectual capital Tehran Stock Exchange company and test the impact of these variables on the profitability of these companies. The practical aim of this study is quasi-experimental design. To access the desired information for the implementation of the research, all related to Stock Exchange website has been used. To test the partial regression coefficients between the hypothetical dairy research, Spss software is used. When the study is based on financial data forms sometimes provide the main source of financial information for the years 2007 to 2010 in the study were considered. In addition, the notes accompanying the financial forms sometimes provide value-added intellectual capital is used to calculate the index. This study uses data of listed companies in Tehran Stock Exchange as the sample. Hey provide companies with the information from this study have been excluded. Ban perched sector investment and financing and financial profile due to the different and leverage as well as the inherent differences that other companies have been excluded from this study. Samples of 100 companies were considered for 4 years, finally, 458 companies - years were tested.

### 5. RESEARCH HYPOTHESES

The model is based on the assumption that the rate of value-added intellectual capital and the development of value added Measurement Company may affect the market value (Pulic , 1998). This method is feasible among 250 randomly carried out. Based on the results, the close relationship between the performances creates value by source (which is the same rate of value-added intellectual capital) and the market value of companies was established. The coefficient value of intellectual capital, creating value in the company's performance is measured. Rate of value-added intellectual capital on the principle that the value of the topics raised by two factors: physical capital resources and intellectual capital resources. On the other hand, as already mentioned, several studies on the role of intellectual capital performance in efficiency and profitability, companies have endorsed. Now you should be looking for evidence that intellectual capital Tehran Stock Exchange companies have an important role in explaining the efficiency and profitability. In order to achieve the above goals, the principal research deemed to be drafted as follows:

1. The relationship between intellectual capital and there is a positive net profit in the Tehran Stock Exchange.
2. between intellectual capital and return on assets in the enterprise there is a positive relationship between the Tehran Stock Exchange.

3. Between intellectual capital and return on equity, there is a positive relationship between the companies of Tehran Stock Exchange.
4. between intellectual capital and earnings per share in the enterprise there is a positive relationship between the Tehran Stock Exchange. To better understand the value of intellectual capital as well as three aspects of this study, the effects of each of these components separately investigated. It seems that the model triad of power will account for more than a single-sided model. The sub-hypotheses are upgraded as follows:
5. The performance of physical capital, human capital and structural capital Tehran Stock Exchange with net profit companies is related.
6. The performance of physical capital, human capital and structural capital and return on assets in the Tehran Stock Exchange companies there.
7. The performance of physical capital, human capital and structural capital and return on equity are related companies of Tehran Stock Exchange.
8. Between the performances of physical capital, human capital and structural capital Tehran exchange earnings in the enterprise there.

## 6. CONCEPTUAL MODEL

To test the hypothesis, the methods of data analysis and correlation analysis, in order to determine the type and extent of the relationship between variables is used. The multiple regression analysis to determine the impact of the independent variable on the dependent variable is used. The research generalized least squares regression method used (GLS) undergone. Regression analysis data (panel), which is also called constant factor model in which the cross-sectional data and time series are mixed together in one column. In order to neutralize the effects of control variables and to eliminate inter-correlations between variables were analyzed using stepwise regression. Also, the correlation between residual sentences camera Watson statistic (DW) and to evaluate the VIF index is linearly independent variables. Where the errors are not normally distributed, the logarithm of the variables has been replaced by variables.

## 7. RESULTS AND DISCUSSION

Figure One, the enterprise value creation Tehran Stock Exchange of views in the period 2007 to 2010 shows VAIC. Performance of enterprise intellectual capital, Tehran Stock Exchange during the years 2007 to 2010 at a rate almost identical Lehigh is declining. This trend, rather than authorities draw serious debate. Multiple regressions to assess the cumulative intellectual capital and its ability to predict the profitability of companies, after controlling for variables company size, leverage, and asset turnover was used. initial analysis in order to ensure that no violations of regression assumptions were used in their entire test. Summary results of the first hypothesis test, shown in Table 1. The results show that the significance level of 5%, the net profit of companies and intellectual capital there is a significant positive relationship. The size of the company and to give the two variables was significantly associated with the company's net profit. The greatest impact on profit as well, by changing the size of the company. The fifth test results are shown in Table II between physical capital and structural net profit companies with a significant positive relationship exists. But human capital, in terms of statistics, with a net profit did not reveal significant relationship. In this model, the variable size of the company also has the greatest impact on net income. Summary results of the testing are shown in Table 3 results show that the fitted regression equation, the situation had well is an estimate. Based on these results we can say that a significant level of five per cent, the return on intellectual capital assets in companies Tehran Stock Exchange has a positive and significant impact. The second hypothesis at 95% of the surveyed companies is approved. Variables studied, 68 percent ROA index explain financial structure undertaken. The relationship between intellectual capital and return on assets 61% It is a positive. In particular, according to Table 4, first, the return on assets of the company and each of the components of intellectual capital is a significant relationship. Secondly, because of physical

capital has the highest ratio in the regression equation, so it can be concluded that physical capital in return, is more effective than other components of intellectual capital. The third hypothesis test results as shown in Table 5. High power, return on equity, suggests that 68% of the index changes significantly the control variables and the intellectual capital of companies influenced. The standard beta coefficients related to intellectual capital and return on equity companies represent 78 percent. The coefficients for the control variables, the debt ratio has tended circulation by 21 percent, 16 percent and 12 percent of children. Shows the explanatory power of intellectual capital is very high compared to the control variables, and the variable performance is more dependent on intellectual capital. However, the table of No. 6, the efficiency of physical capital and structural capital are both positive and significant correlation with equity returns are. The company's return on equity and human capital, there is no significant relationship. Table 7 shows the results of the fourth hypothesis. The results showed that the earnings per share intellectual capital company had a significant positive impact. About 45 percent of the variance of the index is anticipated by the Company of intellectual capital. The results also indicate that the standardized coefficients of variance explained by the EPS of more intellectual capital components of the control variables. this cultivar, intellectual capital, and for each of the variables measured 75%, 15%, and the ratio of debt, 9% Criteria. Among currencies, with earnings per share, there is no significant relationship. Table 8 shows the results of 46% of the variance for EPS is expected by the components of intellectual capital. Standardized beta coefficients indicate that all components of VAIC and significant positive impact on earnings per share. The highest correlation to the performance of the capital, structural capital and human physical performance belongs is in the later stages.

Table.1

$NP = \beta_0 + \beta_1(VAIC) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	$\beta$	sig.	VIF
VAIC	.333	1.068	0.000	1.523
FSIZE	.690	.830	0.000	1.290
DEBT	-.175	-.723	0.000	1.216
ATO	.055	.058	0.003	1.003
Adjusted R-square = 0.887 Durbin-Watson = 1.952				

Table.2

$NP = \beta_0 + \beta_1(CEE) + \beta_1(HCE) + \beta_1(SCE) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	$\beta$	sig.	VIF
CEE	0.201	1.053	0.000	1.380
HCE	-0.050	-.016	0.079	3.054
SCE	0.327	1.242	0.000	2.756
FSIZE	0.794	.944	0.000	1.530
DEBT	-0.160	-.649	0.000	1.256
ATO	0.005	.005	0.759	1.095
Adjusted R-square = 0.915 Durbin-Watson = 1.889				

Table.3

$ROA = \beta_0 + \beta_1(VAIC) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	$\beta$	sig.	VIF
VAIC	.610	27.468	0.000	1.480
FSIZE	-.140	-2.322	0.000	1.230
DEBT	-.403	-23.174	0.000	1.223
ATO	.090	1.33	0.004	1.008
Adjusted R-square = 0.682 Durbin-Watson = 1.926				

Table.4

$ROA = \beta_0 + \beta_1(CEE) + \beta_1(HCE) + \beta_1(SCE) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	B	sig.	VIF
CEE	0.529	37.892	0.000	1.439
HCE	0.082	0.380	0.040	2.997
SCE	0.361	18.747	0.000	2.735
FSIZE	0.065	1.041	0.023	1.491
DEBT	-0.306	-16.856	0.000	1.287
ATO	-0.039	-0.548	0.117	1.491
		Adjusted R-square = 0.818    Durbin-Watson = 1.721		

Table.5

$ROE = \beta_0 + \beta_1(VAIC) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	$\beta$	sig.	VIF
VAIC	776 .	60.414	0.000	1.468
FSIZE	-.213	-6.038	0.000	1.230
DEBT	.157	15.830	0.000	1.219
ATO	.122	3.130	0.003	1.008
		Adjusted R-square = 0.682    Durbin-Watson = 1.926		

Table.6

$ROE = \beta_0 + \beta_1(CEE) + \beta_1(HCE) + \beta_1(SCE) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	$\beta$	sig.	VIF
CEE	0.559	71.853	0.000	1.426
HCE	0.025	0.211	0.655	3.004
SCE	0.593	55.196	0.000	2.728
FSIZE	0.013	0.383	0.737	1.491
DEBT	0.264	26.651	0.000	1.277
ATO	-0.030	-0.756	0.387	1.115
		Adjusted R-square = 0.644    Durbin-Watson = 1.793		

Table.7

$EPS = \beta_0 + \beta_1(VAIC) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	$\beta$	sig.	VIF
VAIC	746 .	2403.862	0.000	1.450
FSIZE	-.155	-181.2340	0.001	1.235
DEBT	.063	255.651	0.163	1.201
ATO	.009	9.651	0.822	1.009
		Adjusted R-square = 0.453    Durbin-Watson = 1.954		

Table.8

$EPS = \beta_0 + \beta_1(VAIC) + \beta_2(FSIZE) + \beta_3(DEBT) + \beta_4(ATO) + \epsilon_i$				
	beta	$\beta$	sig.	VIF
VAIC	746 .	2403.862	0.000	1.450
FSIZE	-.155	-181.2340	0.001	1.235
DEBT	.063	255.651	0.163	1.201
ATO	.009	9.651	0.822	1.009
		Adjusted R-square = 0.453    Durbin-Watson = 1.954		

## 8. Conclusion

As previously mentioned, in recent years the dominant economic paradigm shift from industrial to knowledge-based economy, organizations are in a situation. Physical and financial resources can not only pay attention only to the survival of their organizations against their rivals guarantee. the only way to use a combination of physical capital, financial and intellectual, which can create a sustainable competitive advantage for the organization of the third millennium, to provide grounds for their survival. This study was to investigate the relationship between intellectual capital and some of the firm's stock indices in Tehran After calculating the value of corporate intellectual capital using Pulic for a period of four years, the relationship between

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intellectual capital and profitability was examined. The results of multiple regression analysis showed a positive correlation with net income of intellectual capital and ratios the dependent variable was the profitability of this study has had. To explain the positive relationships can be said that due to the intellectual capital efficiency, increase profitability and financial performance of companies in the Tehran Stock Exchange. Then the relationship with the dependent variables was measured for each of the components of intellectual capital. Multiple regression analysis showed positive correlation between physical capital and structurally weak, with net profit figure, but human capital is not any significant relationship with the net profit. Also, according to what we had already anticipated this variable, most of all influenced by the size of the company is located. In the next step regarding each of the components of intellectual capital with the dependent variables were measured. Multiple regression analysis also showed that the three components of intellectual capital have a positive relationship with return on assets of the company is. This means that by increasing the amount of each of these three components to a company, the company increased its return on assets. The research findings demonstrate that higher physical capital and structural performance has a positive correlation with equity returns, but the relationship between human capital efficiency and return on equity is not significant. Interestingly, these relationships, the impact of capital structure more efficient than physical capital is, in fact, Become a physical and financial teeth to teeth structure has also become an added value, leading to improved return on equity companies will sometimes provide the Tehran Stock Exchange. Earnings per share were the following variables were tested. This variable has a positive and significant relationship with each other is intellectual capital. Most of the changes in these components could anticipate earnings in the four years studied. a significant insight into the practical implications of this research for officials, managers, investors, researchers and with the accounting profession. In this economy, financial assets such as machinery constitute only a small fraction of an organization. The real wealth and superior absorption and utilization of human resources specialists, knowledge and skills, organizational culture, Public relations and reputation with customers, and in a word, the intellectual capital of the organization. Since these intangible assets are not reflected in the balance sheet and at the same time the most organizational performance, value and profitability of their dramatic impact. Attention, resources and excellent management organizations are increasingly emphasizing business units is recommended. With appropriate investment in intellectual capital of the organization and its efficient management, the groundwork for increased profitability and provide wealth business. As well as brokerage firms, banks and credit institutions suggested that the classification of listed companies on the stock exchange, in terms of intellectual capital, a series of knowledge-based businesses with special attention to the subject of intellectual capital and application of business process to prioritize their credit programs. Actual and potential investors are recommended in order to assess the financial condition, evaluate performance and Provisions for proper and logical decisions, in addition to the forms sometimes provide financial, to assess the situation more closely in the management and utilization of their intellectual capital. Since the accounting profession must sometimes provide opportunities to measure and examine factors that increase a company's value, so the intellectual capital of the profession will create conflict. Evaluation of intellectual capital requires quick and accurate indicators of the historical method is not assess the other hand, leads to a loss of specificity of the accounting information. In addition, it requires the same quantity of intellectual capital, including new audit process and the measurement is reliable and accurate. Providing consulting services to companies, it can properly measure intellectual capital, if they fail in this task accountant's management consultants and other professional service providers will eliminate this gap. The researchers recommended further various aspects and other aspects of intellectual capital review. Also, methods of assessment and evaluation of intellectual capital in order to find appropriate methods, as appropriate for future research could be. Further investigation of methods for promoting growth and taking advantage of its intellectual capital in their organizations to improve industry performance, significant themes in economics and business have country.

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