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## RESEARCH ARTICLE

### THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL, FIRM VALUE AND TRANSPARENCY

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#### ABSTRACT

The present study examines the role of intellectual capital in firm value and the transparency in the company's reported earnings. For this purpose, the companies listed in Tehran Stock Exchange were examined and 207 running within 2003 to 2012 were selected as the ultimate samples of the study. Multiple regressions were used to test assumptions and the company's size as well as its financial leverage variables was chosen as control variables. The results reveal that companies with a higher intellectual capital were of higher value. However, the results did not show a significant relationship between intellectual capital and transparency. Results did not show a significant relationship between the size of the firm, firm value and transparency. According to the findings of the study, companies with higher financial leverage were less valued. The study found no significant relationship between financial leverage and transparency.

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#### INTRODUCTION

Twenty-first centuries is described by the significance of knowledge and its impact on all aspects of any enterprise. Today, knowledge has turned into the key source of economy and the reigning source for - and perhaps the only reigning source for -competitive advantage (Ohlson, 1995). Knowledge as an asset compared with other types of assets has this unique nature that the more it is used, the more is added to its value. Implementation of an effective knowledge management strategy and turning into a knowledge-based organization would be a mandatory requirement for the success of organizations which are entering to the era of knowledge-based economy (Antola *et al.*, 2005). Companies should have competitive advantages to be able to improve performance and compete with competitors so that they can have higher performance, and sustain in the market during complicated and transitory conditions. In recent years not only the sensitivity of competition in the market has increased, but its nature has changed as well; companies now have turned their attention from investing in tangible resources to more intangible resources for gaining access to superior performance and competitive advantage (Ram swami *et al.*, 2009).

Most countries in the world (including Iran industries) are using traditional methods of financial accounting which were developed centuries ago for a business environment based on tangible assets such as equipment and building works and iodine, while the business environment based on Knowledge requires a new organizational model that takes into account new intangible organizational assets such as knowledge and human resources competences, innovation, customer relationships, organizational culture, systems and processes, organizational structure, among others. It seems that traditional accounting , provide inaccurate reports of the real value of firms; Hence, the gap formed between book value and market value has been a common shortcoming in the traditional accounting systems of many firms, in recording and reflecting the value of intellectual capital in the calendar, which has causes the above mentioned disagreement (Chan, 2009).

#### Theoretical Foundations

The importance of intellectual capital has increased by leaving the industrial age behind and moving towards the information age. This can be the result of factors such as the importance of the revolution of information technology, the increasing importance of knowledge, knowledge based economy and the impact of innovation and creativity as a determining element in competition (Guthrie, 2001). During the industrial age, the price of property, machinery, equipment and raw materials

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were consider efficient elements of any business unit, while in the information age, efficient use of intellectual capital determines the success or failure of a business unit (Goth, 2005). Despite the importance of tangible assets in the production of goods and services in modern economy, economic value and wealth is often generated by development and application of intellectual capital rather than management of tangible assets. The severity of this issue is to the extent that around 50 to 90 percent of the value created by companies in today's economy, is achieved by intellectual capital management; Therefore, competing in an economy which relies heavily on science and technology, necessitates allocating major part of development to research and development resources, staff training and new technology (Sunnier *et al.*, 2007).

Providing a precise definition of intangible assets and intellectual capital is difficult. Definitions provided in the accounting literature, is wide and varied, and each of these definitions of Intellectual Capital focuses on different features. The literature on intellectual capital signifies the value and intangible nature of these resources. The first attempts related to the concept of intellectual capital belongs to the studies conducted in 1962 by Matchup, but the concepts of intellectual capital was first coined by Galbraith in 1969. He believed that intellectual capital is something beyond mind and it includes intellectual action as well.

This means that the literature on intellectual capital in explaining the concept of intellectual capital, moving from having knowledge to using knowledge, points to the fact that the relationships and processes for being considered as intellectual capital, need to transform knowledge into a product or a service valuable for the organizations, companies, etc. Furthermore this guides us from possession of knowledge to application of knowledge, a process which has resulted in development of various definitions for intellectual capital (Hemati *et al.*, 2010). A brief look at definitions of intellectual capital indicate that the scholars still have not agreed on a single definition, but there are some similarities in various definitions in many respects. All these definitions are based on the principle that intellectual capital includes organization's total intangible assets, consisting of human capital, structural capital and relational capital. Intellectual capital consists of those intangible assets generated by information technology, corporate culture and credit, which are crucial to the competitive potential of the firm.

The kind of Intellectual capital which consists of three elements of human capital, structural capital, relational capital, takes into account exogenous variables (Rezai *et al.*, 2010). Intellectual capital has been defined in many ways, some of which will be explained below: Sveiby (1985), classifies intellectual capital into three levels of intangible assets which include external structure, internal structure and competence of employees. Hall (1992), states that intellectual capital can be classified under assets (such as a brand) or skills (such as technical knowledge of personnel or organizational culture). Klein *et al.* (1994) believe that intellectual capital is an intellectual substance collected and formulated for producing a more valuable asset. Bontis (1996), considers intellectual

capital a volatile and elusive subject, but he believes that, when discovered and utilized, it makes the organization capable of competing with a new resource in the external environment.

Edvinsson *et al.* (1996), state that intellectual capital is a kind of knowledge that can be converted into value. Brookings (1996), states that intellectual capital is a combination of four major parts: market assets, human-centered assets, intellectual assets and infrastructure assets. Roos (1997), sees intellectual capital as all processes and assets, which are not presented in traditional balance sheets. It also includes those intangible assets (such as trademarks and patents) which are taken into account by modern accounting. Hence, intellectual capital is the sum of organization's knowledge of its members and practical application of that knowledge. Stewart (1997) defines intellectual capital as intellectual material such as knowledge, obligations, intellectual property (assets), and experience that can create wealth. Bontis (1998), defines intellectual capital as to search for, and effective use of knowledge (as manufactured goods) compared to data (raw materials). Bontis *et al.* (2000) in another definition state that in a simple classification intellectual capital has three components of human capital, structural capital and relational capital.

Seetharaman *et al.* (2002) consider intellectual capital as the difference between the book value of an organization and replacement cost of its assets. Marr (2004), defines intellectual capital as a set of knowledge assets that belongs to an organization and is considered as a component of organization's characteristics, and considerably improves organizational competitiveness through adding value to key stakeholders of the organization. Qlichli *et al.* (2006), new sources of consider intellectual capital as a platform on which new resources are generated, and through which organizations will become able to compete. Abbasi *et al.* (2010), believe that there are two approaches towards intellectual capital in the financial literature: The first approach improves organizational infrastructure, staff learning, communicative and other skills so as to enhance long-term performance of the company through improvements in organizational knowledge. In the second approach, intellectual capital is a kind of measurable financial assets that can bring about profit.

Hemati *et al.* (2011), acknowledge that intellectual capital is not in full control of the Organizations and firms, since any individual leaving the organization leads to the loss of institutional memory, which is a threat to organizations. Employees of an organization produce intellectual capital through their competencies, attitudes and intellectual brilliance. These competencies which cover the behavioral components of employees include skills, education and attitudes of employees. Mehrmanesh *et al.* (2012), believe that intellectual capital is a kind of assets which measures organization's ability to create wealth. Such assess is not of a physical or ostensible nature. Rather, it is an intangible asset which is obtained through the use of assets associated with human resources, organizational performance and relationships outside the organization. All these features lead to the creation of value, because intellectual capital is a purely internal phenomenon not capable of being transacted. In the new economy, virtual and intangible assets together with real and tangible assets specify the value of an organization. According to the resource-based view, companies

with valuable resources are more likely to achieve higher performance in intellectual capital. However resources that improve the company's performance are regarded as valuable; therefore companies' resources have significant influence on their success (Yang *et al.* 2008). Most organizations can provide detailed information about their tangible assets like lands, buildings, machinery and equipment but usually do not have any official record of their intangible assets such as trademarks, human capital, copyright and patent, spending on research and development and human resources, which can improve growth and efficiency of organizations (Jasrotia, 2004). Among the varied responses to the question why do companies differ in their performances, one answer could be that it is because of the difference between the values of their intangible assets. In the modern economy, wealth creation and economic growth mainly stem from intangible assets.

The development of the new economy, is an indication of the fact that creation of value, depends more on the intangible assets rather than tangible (physical and financial) assets; therefore, intellectual capital is the major source of economic development while financial assets are placed in the second level of importance. In such circumstances, intellectual capital should be considered the key factor in promoting the value of companies (Fetros *et al.*, 2010). Intellectual capital is associated with factors such as staff knowledge, abilities and skills, of which corporate value is enhanced. In line with above, Barney (1991) states that intellectual capital is of intangible nature and is generally conceived as a strategic asset in organizations. Intellectual capital in organizations improves financial performance, growth and competitive advantage of the organization and consequently increases the value of company's shares. Also Chen *et al.* (2004), state that intellectual capital refers to factors such as knowledge, skills, capabilities and attitudes of employees which results in performance improvements that customers are willing to pay for, and brings about growth and profitability for the company.

Intellectual capital has obliged organizations to depend to a great extent on knowledge and skills of employees for generating revenue and growth and improve efficiency and productivity (Sveiby, 1997). In addition, Intellectual capital can affect transparency of earnings. Bushman *et al.* (2004) defines company's information transparency as a situation in which information is widely available, relevant, reliable, comprehensive and up to date. Today, hardly anyone can ignore the importance of transparency in financial reporting, since shareholders and creditors make their investment decisions based on companies' financial information. They want more and clearer information on financial reporting, which can provide a safe environment and enhance investor confidence and trust.

Transparency has a positive effect on companies' performance and can protect the interests of shareholders. Vague financial statements hide company's debts and if the company is on the verge of bankruptcy, the situation remains hidden. Therefore, transparency is of the significant appeal for shareholders. The present study sets out to find the effect of intellectual capital on corporate value and transparency.

## Review of the Related Literature

Namazi and Ebrahimi (2009) examined the effect of intellectual capital on current and future financial performance of listed companies in Tehran Stock Exchange. 120 companies running within 2004 and 2006 were included in the study sample. The results of testing the hypotheses using "partial least squares regression method" suggests that regardless of the corporate size, debt structure and past financial performance, there is a significant positive relationship between the company's intellectual capital, current and future financial performance, both in the level of all companies and in the level of industry. Abbasi and Goldi (2010) examined the impact of intellectual capital elements on the financial performance of companies engaged in Tehran Stock Exchange. Results obtained from the least squares combination method, showed that the performance coefficient of each of the elements of intellectual capital had a positive and significant impact on the rate of return on equity.

The impact of coefficient of efficiency of physical and human capital on each share was positive while the impact of coefficient of efficiency of structural capital on each share was negative and significant. Moreover, the results showed that companies with higher intellectual capital had better financial performance. Pourzamani *et al.* (2012) examined the effect of intellectual capital on market value and financial performance. The results reveal that the relationship between intellectual capital and the market value (the ratio of market value to book value) is not significant. This finding confirms the existence of growing gap between market value and book value of companies. And the results obtained from tests show that the efficiency coefficient of intellectual capital has a significant positive effect on financial performance (return on assets) of companies. Qaemi and Alavi (2012) examined "The relationship between transparency of accounting information and cash".

In this study, transparency of accounting earnings has been set as the measure of transparency of accounting information, and its impact on cash holding is investigated. The research was carried out during the years 2004 to 2010. The findings show that there is a significant negative relationship between transparency of information and maintenance of cash. Pasaribu *et al.* (2012) in research on 78 manufacturing firms and using classical regression method showed that there was a positive relationship between intellectual capital and firm performance. However, this study did not show a significant relationship between intellectual capital and the growth rate. Rehman *et al.* (2012) also analyzed the effect of intellectual capital components on the performance of banks in Pakistan.

The results of this study indicate that there is a positive and statistically significant relationship between human capital and structural capital on the one hand, and return on assets and return on equity on the other. The results also reveal that there is a positive and significant relationship between physical capital and return on equity. Venugopal and Subha (2012) in their study confirmed that there is a significant positive relationship between structural and physical capital, and company's performance. Latif *et al.* (2012) examined the effect

of intellectual capital components on the performance of companies, using multiple linear regressions during the years 2006 to 2010. The results of the study indicate that there is a relationship between components of intellectual capital and profitability, productivity and increase in the corporate value. Abuja (2012) conducted a research for the banking industry in India within 2007. It was proven that intellectual capital had appositive and significant impact on banks future performance. Long *et al.* (2012) in a study entitled "Transparency, liquidity and value" examined the relationship between the level of corporate information transparency, liquidity of the capital market and corporate value. The results suggest that with increased cash flows, cost of capital and corporate value (Kiwi Tobin ratio) would be higher.

Berzkalne and Zelgalve (2013) also examined the relationship between intellectual capital and corporate value. This research has focused on the profound difference between book value and market value of company assets, and the results indicate that there is significant relationship between intellectual capital and corporate value.

### Research Hypotheses

This study examines the relationship between intellectual capital, corporate value and transparency of corporate earnings. The following assumptions have been put forward:

- There is a significant relationship between intellectual capital and corporate value.
- There is a significant relationship between intellectual capital and transparency.

### Research Methodology

The operational definitions for dependent, independent and control variables, together with models and other specifications of research methodology are stated in this section.

Intellectual capital (independent variable)

In this study, the model proposed by Pulic (1998) as a way to measure corporate performance, was utilized to measure the rate of intellectual value-added. The intellectual value-added ratio indices are formulated in the following algebraic expression:

$$VAIC_i = CEE_i + HCE_i + SCE_i$$

Each of the above components will be provided with operational definitions;

The efficiency of communication capitals measured as follows:

$$CEE_i = \frac{VA_i}{CE_i}$$

In the above formula:

CEE<sub>i</sub> = efficiency of communication capital for company I  
CE<sub>i</sub> = the net book value of company assets (book value of total assets of the company - its intangible assets)

VA<sub>i</sub> =value added of company and the value added of company in year I am calculated through the following formula:

$$VA_i = OP + EC + D + A$$

VA = value added

OP = operational profit

EC =employee cost

D = depreciation of tangible assets

A = depreciation of intangible assets

Human capital is one of the company's performance characteristics of intellectual capital is calculated as follows:

$$HCE_i = \frac{VA_i}{HC_i}$$

According to the formula:

HCE<sub>i</sub> = human capital efficiency for company I

VA<sub>i</sub> = overall value added for company I

HC<sub>i</sub> = total salary and wage costs for company I

As a result, the efficiency of structural capital is calculated as follows:

$$SCE_i = \frac{SC_i}{VA_i}$$

SCE<sub>i</sub> = capital structure efficiency for company I

SC<sub>i</sub>=capital structure of company I

To calculate the efficiency of the capital structure, the first step is to calculate the company's capital structure as follows:

$$SC_i = VA_i - HC_i$$

While in the above formula:

SC<sub>i</sub> = the capital structure of the company I

VA<sub>i</sub> = overall value added for company I

HC<sub>i</sub> = human capital that is equal to total salary and wage costs for company I

VA<sub>i</sub> = overall value added for company I

Corporate value (dependent variable):

Tobin Q ratio in this study represents corporate value. Tobin Q ratio measures a company's value by dividing the company's market value to the book value of its assets (Sameti and Moradian 2005).

$$\text{Tobin}Q = \frac{\text{company's market value}}{\text{book value of compny's asset}}$$

### Transparency (of profit) (dependent variable)

In this study the model proposed by Barrett *et al* (2008) is used to define transparency of profit. This model defines transparency as simultaneous change in profit and changes in profit and stock returns. An indicator that measures the level of transparency is the determining coefficient which is obtained from regression of stock returns on profits and its changes. The index is interpreted as a transparency of profit, because the profits and change in profitability reflects changes in economic conditions which are measured by stock returns. To measure the transparency of profit the following model is used:

$$R_{i,t} = \alpha_0 + \alpha_1 F_{i,t} / P_{i,t-1} + \alpha_2 \Delta F_{i,t} / P_{i,t-1} + \epsilon_{i,t}$$

The above model variables are:

R<sub>i,t</sub> = annual stock returns

E<sub>i,t</sub> = Earnings per share before unusual items

ΔE<sub>i,t</sub> = change in earnings per share before unusual items

P<sub>i,t-1</sub> = stock price

Company size (control variable):

The company size is measured using the natural log of assets at the end of the fiscal period.

SIZE = ln (assets at the end of the fiscal period of the company)

Financial leverage (control variable):

The ratio of debts to assets represents leverage.

$$\text{Financial leverage} = \frac{\text{depts}}{\text{assets}}$$

To test research hypotheses F test and t-test was used. The research experimental models are as follows:

The first hypothesis model:  $VALUE = \alpha + \beta_1 IC + \beta_2 SIZE + \beta_3 LEV + \epsilon$

The second hypothesis model:  $TRAN = \alpha + \beta_1 IC + \beta_2 SIZE + \beta_3 LEV + \epsilon$

In these models, IC: intellectual capital, VALUE: value of the company, TRAN: transparency of profit, SIZE: corporate size and LEV represents financial leverage. The study population consisted of all companies listed on Tehran Stock Exchange which did not have a more than 5 months operational change or interruption in the study period. Therefore, the study sample consists of 207 stock companies running within 2009 and 2012.

**RESULTS**

In order to gain better understanding of community under research as well as variables of this research, it is necessary to describe these data before starting to analyze statistical data.

Statistical description of data is a step in identifying patterns governing the data as well as a basis for explaining the relationship between variables that are used in the research. Using methods of descriptive statistics, characteristics of a set of data can be exactly stated in a summary. Descriptive statistics are always used to determine and report characteristics of research data. In this regard, descriptive statistics related to the variables of this study are as follows:

**Table 1. Statistical indices of research variables**

Variable	Mean	Median	Standard deviation
Intellectual Capital	14.12	10.06	14.91
Corporate value	1.59	1.37	0.77
Transparency profit	0.59	0.67	0.34
Corporate Size	13.34	13.23	1.42
Leverage	0.64	0.64	0.23

In this study, F-value indicates whether regression model of the study is appropriate or not. This can be specified through the significance of F in tolerance level of larger or smaller than 0/05. The significance of the model is demonstrated in the following table. (0/05p-value<)

**Table 2. Regression significance test**

Test Description	The first hypothesis	The second hypothesis
F test	0.000	0.002

The results of the above table show that the independent variables can properly explain the changes in the dependent variable. All statistical methods are based on assumptions and principles the validity and correctness of which should be assessed for correct and consistent use of these methods. In this study linear regression is used which encompasses the universal variance assumptions, homogeneity and independence of the residuals, and nonexistence of co-linearity. In this study, homogeneity of variances are assessed by the scatter plot of residuals against fitted values. If the scatter plot does not reveal any particular pattern and dots be scattered like a ball on the graph, we can be certain about the homogeneity of variances. The normality of residual in this study is controlled by the probability plot of normality of regression residuals and the standard residual.

**Table 3. Testing the appropriateness of regression models for research hypotheses**

Criteria for the regression model appropriateness	The first hypothesis	The second hypothesis
Homogeneity of variances		
Normality of residuals		
Independence residuals	Watson camera base 1.73	Watson camera base 1.80

Normal probability plot is graph in which the values of the empirical distribution function of the sample is plotted against the normal distribution function. If the variable is normally distributed these dots are placed on the bisector of the first quarter. One of the underlying assumptions of an assumption is that the independence of the residuals has been evaluated by Watson camera test, and if the value is between 1 and 3 the assumption of independence can be almost accepted. The table below displays the assumptions underlying linear regression, indicating that the model fitted to the data has sufficient validity.

The last underlying assumption is the absence of co-linearity among predictor variables. To distinguish the line between predictor variables VIF statistics will be used. VIF test results indicate that these statistics have been less than 10. Hence, current assumption underlying regression is approved.

**Table 4. Absence of co-linearity (VIF statistics)**

Variable name	VIF statistics
Intellectual Capital	1.506
Corporate Size	1.102
Leverage	1.394

In the final stage, t-student test<sub>t</sub> was used for testing the above hypo theses. The hypotheses test results based on the above analysis is presented in the following table:

**Table 5. Hypothesis Results**

Variable	The first hypothesis		The second hypothesis	
	Beta coefficient	Possibility ratio	Beta coefficient	Possibility ratio
Intellectual Capital	0.068	0.04	0.008	0.84
Corporate Size	-0.035	0.263	-0.017	0.60
Leverage	-0.297	0.000	0.015	0.67

Based on the results achieved in the first hypothesis, the beta coefficient is 0.068, with the possibility of 4 percent. Therefore the first hypothesis is confirmed with 5% tolerance. In addition, these results suggest a negative significant relationship between corporate leverage and corporate value. However, no significant relationship between corporate size and corporate value was found. Based on the results achieved for the second assumption, beta coefficient is 0.008 with probability of 84%. Therefore, the second hypothesis is not confirmed with 5% tolerance. In addition, these results do not show any significant relationship between corporate size and financial leverage, and transparency.

### Conclusions and Recommendations

The results suggest that there is a direct and significant relationship between intellectual capital and firm value. Moreover, based on the theoretical foundations of the study, intellectual capital is considered as intangible assets of the company that can increase the value of the company. The existence of significant relationship between intellectual capital and firm value, in the research carried out by Latif *et al.* (2012) and Berzkalne and Zelgalve (2013) is also confirmed. However, the results did not show a significant relationship

between intellectual capital and transparency. The results did not show a significant relationship between corporate size, corporate value and transparency. The results also show a negative and significant relationship between financial leverage and corporate value. In fact, according to the results, companies that used debt leverage for financing were less valued. However, no significant relationship between financial leverage and transparency of profit was found. The present study has a few limitations. The results of this study can be generalized only to the stock corporate. Therefore, generalization of the results to companies outside the stock exchange must be done with caution. In addition, it is suggested for further research to investigate the role of intellectual capital in guiding companies in circumstances such as economic crises. It is also suggested to investigate the effect of intellectual capital on other issues such as economic value-added, etc.

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