

A Survey of the relationship between intellectual capital and firm performance criteria

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Abstract: Intellectual Capital and complete a new model for organizations to provide real value and can be used to calculate the future value of the company. Because of this, the desire to measure the true value of intangible assets and intellectual capital firms with more shareholders (investors) and other stakeholders has increased. The purpose of this study was to investigate the relationship between growth rate and efficiency of intellectual capital stock. Due to the increasing interest in and attention to the concept of intellectual capital firms, this study attempts to honor the concept is considered in the country. The sample consisted of 137 listed companies on the Stock Exchange during the period 4 Year 2010 From 2013 to collect and summarize the hypotheses were tested using Pearson's correlation and regression tests, Significant test statistics of the models t and F Took place at 95 percent Findings indicate that intellectual capital is a significant relationship with stock returns but did not show a significant correlation between the growth rate of sales.

Key words: Intellectual capital; Financial performance; Sales growth; Economic value added

1. Introduction

With the revolution in information technology in the years after 1990, patterns in the world economy have changed radically. In today's economy, knowledge as the most important asset, has replaced physical and financial capital (Ghelichlee and Moshabbaki, 2006). Identifying and assessing the value of knowledge has continued from the past to the present and it is precisely the reason why most firms do not report it. This causes properties to remain invisible to the world outside the institution and sometimes even unrecognizable to the employees within the organization. Thomas Stewart, one of the pioneers in this field, has popularized the term intellectual capital for assets of this kind (Dastgir and Mohammadi, 2009). In the twentieth century, economy was based in industry. In that century, companies and countries with greater physical and financial assets would produce more wealth. However, the 21st century economy is based in knowledge.

For example, Seetharaman quotes from Kendrick, an American economist, that in 1925, intangible to tangible asset ratio was 30 to 70 but increased to about 63 to 37 in the 1990s (2002). Stewart argues that human capital is the most important asset of any company (1991). It is expected therefore that companies with higher intellectual and human capital exhibit higher financial performance. In fact, traditional financial reporting cannot calculate the actual enterprise value and only does with measuring short-term financial balance sheet and

tangible assets. This is despite the fact that in recent decades, companies have expressed special attention to measuring intellectual capital for reporting to stakeholders and are trying to find a way to assess internal intangible assets and determine the value of intangibles in organizations (Young Chu, 2006). Intellectual capital provides a new perfect model for observing the actual value of an organization and also for calculating the future enterprise value. For this reason, the tendency to evaluate and consider the actual value of intangible assets and intellectual capital has further increased among firms, shareholders (investors) and other stakeholders.

2. Problem statement and significance of the study

Intellectual capital is a form of capital beyond physical and tangible assets (Ebrahim Abbasi et al., 2010). One of the influential factors in decision-making by managers, investors and creditors is the ability to repay and business unit profitability. The present study aims to find a relationship between intellectual capital and two performance variables of growth rate and stock return using the Economic Value Added valuation model. Since these two performance factors are important for decision-making, analyzing the relationship between intellectual capital and these factors is the main objective of this study – which is of decisive importance for the success or failure of firms. On the other hand, due to the increasing interest of renowned companies in the concept of intellectual capital, this study is an attempt to appreciate this concept in Iran.

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3. Theoretical basics and literature review

In the industrial era which began in the 1890s, the emphasis was on mass production and distribution. Today, however, the World Wide Web has disposed of the industrial age and triggered the advent of a new era of knowledge. In the era of knowledge, what leads to success in business and industry is human knowledge. This intangible asset is known as the intellectual capital. The development of intellectual capital constitutes the vital area of profitability (Mojtahedzadeh, 2002). Knowledge-based business environments require an approach that encompasses new intangible organizational assets such as human resources knowledge and competencies, innovation, customer relations, and organizational culture, systems, and structures.

The concept of intellectual capital has attracted the interest of academic researchers and organizational practitioners (Ghelichlee et al., 2006). In 1982, 62% of investments in shares of US manufacturing companies were spent on tangible assets which constituted a great share of enterprise value in the market. In 1999, however, this percentage decreased to 16%. This means that about 84% of enterprise value in the market was constituted by intellectual capital (Changand et al., 2008). The results of studies have shown that companies with a higher level of control and focus on their intangible assets are characterized by a better performance and return on investment and a lower volatility of stock prices compared with companies that are oblivious to these assets and to intellectual capital in particular (Bramhndcar, 2007). This becomes even more evident when a company is sold for a price 4 or 5 times the value of its assets. The additional amount is the value of intellectual capital including human and structural assets, communication, brand name, etc. In the majority of cases, these valuable assets have no place in the company's financial statements which makes it difficult to determine the price of a company and the value of its capital. The important thing is that we are lacking a comparable measure that enables us to consider people with the same intensity that we focus on material issues.

A number of international companies, experts and consultants have begun to investigate various techniques for identifying, measuring and reporting intellectual capital within organizations. In this process, new generations of internal and external accounting reporting methods have emerged from within organizations. The results obtained from the reporting of intellectual capital includes improved staff morale, less personnel rearrangement, increased investment in the development of intellectual capital, increased perceived value of a company's intellectual capital by the senior staff and a better understanding of the main factors that are crucial for continued growth and development (Zanjirdar et al., 2008). The aim of this article is to explain different conceptions and definitions of intellectual capital and to elaborate the importance

of management and the reflection of these profitable assets in the financial statements of companies and business units. In this regard, we refer to several intellectual capital measurement models and methods and their quantitative formulas and techniques that enable us to record and report intellectual capital in financial statements.

3.1. Literature review

Monavvarian et al. (2006) in their study examined the impact of intellectual capital on the performance of Mellat Bank, Tehran. This study showed that there was a strong interrelationship between the components of intellectual capital. Madhooshi et al. (2009) in his study examined the relationship between the value of intellectual capital in investment companies listed on the Tehran Stock Exchange and their financial efficiency. The results showed that there is a significant positive relationship between intellectual capital and future financial performance, intellectual capital growth rate and the rate of return on financial investment by companies listed on the Tehran Stock Exchange. Zare (2008) investigated the relationship between knowledge management, innovation and organizational performance. He found that an organization, by knowledge management, can use its resources more efficiently, be innovative and have a better performance. The results showed that knowledge management and innovation have a direct relationship with each other and both have a direct and indirect influence on organizational performance. Namazi and Ebrahimi (2009) in a study investigated the impact of intellectual capital on current and future financial performance. Intellectual capital was calculated based on the Palick model. The results show that regardless of firm size, debt structure and past financial performance, there is a positive relationship between intellectual capital and current and future financial performance of a company at the level of all companies and industries. Furthermore, at the level of all companies and industries, there is a significant negative relationship between firm size and current and future performance and there is a significant positive relationship between past performance and current performance, and past performance and future performance. However, the relationship between debt structure and current and future performance is positive at the level of all companies, negative at the level of all industries, in the chemical and pharmaceutical industry, and not clear in the automotive industry and the industry of metallic and non-metallic mineral products.

Chu (2006) also examined the relationship between the components of intellectual capital (human, relational and structural capital) and performance in specialized advanced industries in the Industrial Technology Research Institute and concluded that firstly there was a significant positive relationship between the components of intellectual

capital and firm performance and that secondly intellectual capital was subject to the process of creating and maintaining values in an organization.

Bramhandkar (2007) in his study investigated the impact of intellectual capital on the performance of 139 pharmaceutical companies and the results indicated that there was a significant relationship between the components of intellectual capital and firm performance. With a focus on Asia and by collecting data from 150 general firms listed on Singapore Exchange Limited between 2000 and 2002, Tan (2009) examined the relationship between the three intellectual capital components (human, structural and relational capital) and financial efficiency (performance). The results showed that firstly there was a significant positive relationship between intellectual capital and the companies' current and future financial performance and that secondly intellectual capital had different impacts on the financial performance of companies in different industries. In a study entitled "the impact of intellectual capital on performance," Appuhami (2007) examined impact of intellectual capital components (human, structural and relational capital) on firm performance in the banking and insurance industry in the country. The results indicated a significant positive correlation between each intellectual capital component and firm performance.

Chang (2008) examined the relationship between intellectual capital components and operational, financial and market performance in the electronics industry in Taiwan Stock Exchange Corporation. The adjusted value added intellectual coefficient was used for measuring intellectual capital. The results indicated a positive relationship between operational performance and the capital employed and no relationship between operational performance and human and structural capital. Intellectual capital components also had a negative relationship with financial and market performance. Furthermore, research and development expenses were positively correlated with operational, financial and market performance. However, intellectual property was positively correlated only with operational performance.

4. Hypotheses and methodology

The present study uses a descriptive design and is conducted in the form of an applied research project in terms of objectives. The purpose of this study is to provide a convenient way to find the relationship between intellectual capital and the variables of growth rate and stock returns and to empirically test these methods on the Tehran Stock Exchange. To this end, we used the economic value added valuation model and the classical linear regression to calculate the value of intellectual capital for each investment firm for a period of 4 years from 2010 to 2012. Then, we used the cross-correlation coefficient to examine the main hypothesis indicating that there is a significant

relationship between the value of corporate intellectual capital and the variables of growth rate and stock returns. The sub-hypotheses are stated as follows:

First hypothesis: There is a significant relationship between intellectual capital and stock returns of a firm.

Second hypothesis: There is a significant relationship between intellectual capital and growth rate of a firm.

We used the F-test in multiple regression analysis with the SPSS software product v.20 to test the research hypotheses and used the EXCEL 2010 software product to create necessary databases. The statistical population of the study includes companies listed on the Tehran Stock Exchange with the following conditions: First, the company had to have an ongoing activity since March 15, 2010, to March 15, 2013. Secondly, the company had to be listed on the Tehran Stock Exchange before the fiscal year 2010 and their fiscal year had to end on March 15. Thirdly, the company had to have no changes in its fiscal year during the time of the study and its data had to be available. And fourthly, investment firms, financial intermediaries, banks and leasing companies were excluded from the statistical population. With the above conditions, of the 437 companies listed on the Tehran Stock Exchange, 137 companies were considered as the convenient sample population. 38 companies were finally sampled for the study based on Cochran's sample size formula.

This study follows Setayesh et al. (2011) in using Economic Value Added (EVA) Model to measure intellectual capital. EVA is calculated as follows:

$$EVA = NOPAT_t - (WACC_t \times Capital_t - 1)$$

Economic Value Added = net operating profit after tax - (weighted average cost of capital * capital used in the company)

Intellectual capital includes all the factors that are present in a business firm in addition to current assets and tangible assets. Intellectual capital includes the factors behind tangible assets and current assets that lead to commercial work and that are the main power achieved by a company. They exist in relation to present or anticipated profits (Stewart, 1998). The return on equity is the ratio of total gains (or losses) from investments to the amount of capital that has been spent in order to earn revenue in a given period. It could be a day, a month, a year or any length of time (Ghaemi and Saeed, 2006).

Return on Equity = (the company's market value at the end of the year - the company's market value at the beginning of the year + approved dividend - raising capital through cash and receivables) / market value at beginning of the year

Finally, in the current study, the growth rate is calculated using sales growth as follows: (Haghighat and Mousavi, 2007)

$$\text{Sales Growth} = [(sales \text{ this year} - sales \text{ last year}) / sales \text{ last year}] * 100$$

5. Description of the hypothesis testing process

To test the research hypotheses, considering the distribution of data, we used the classical linear regression analysis to examine the significance of a linear relationship between the independent and dependent variables and the effect of the independent variable on the dependent variable at the 95% confidence level (5% error).

5.1. Hypothesis 1

H0: There is no significant relationship between intellectual capital and return on equity in a firm
 H1: There is a significant relationship between intellectual capital and return on equity in a firm

Table 1: Regression coefficients with return on equity as the dependent variable

Model	Variables	Standardized coefficients	Non-Standardized coefficients		T-statistic	Significant level	VIF
			Coefficient	Standard error			
1	Constant	----	0.116	0.215	0.538	0.591	----
	Intellectual capital	-0.12	-3.577	0	2.888	0.004	1.012
	Firm Size	0.009	0.003	0.016	0.215	0.83	1.009
	Firm performance	0.249	0.813	0.135	6.013	0	1.004

The significant level for both independent variables (intellectual capital and firm performance) is below 0.05. As a result, they are present in the final regression model. The variables of firm size and the constant value with a significant level above 0.05 are absent in the final model. In other words, there is a significant linear relationship between the independent variables (intellectual capital and firm performance) and the dependent variable (return on equity). Thus, the final model can be defined as follows:

$$RET_t = (-3/577E-08) * IC + (0/813) * ROA$$

The main hypothesis is thus confirmed. This means that there is a significant relationship between intellectual capital and return on equity.

5.2. Hypothesis 2

H0: There is no significant relationship between intellectual capital and growth rate in a firm
 H1: There is a significant relationship between intellectual capital and growth rate in a firm

Table 2: Regression coefficients with growth rate as the dependent variable

Model	Variables	Standardized coefficients	Non-Standardized coefficients		T-statistic	Significant level	VIF
			Coefficient	Standard error			
2	Constant	----	-0.578	0.184	-3.191	0.001	----
	Intellectual capital	0.037	9.454	0	0.893	0.372	1.012
	Firm Size	0.158	0.051	0.014	3.792	0	1.009
	Firm performance	0.18	0.499	0.116	4.316	0	1.004

The significant level for both independent variables (firm size and firm performance) and the constant value is below 0.05. As a result, they are present in the final regression model. The variable of intellectual capital with a significant level above 0.05 is absent in the final model. In other words, there is a significant linear relationship between the independent variables (firm size and firm performance) and the dependent variable (growth rate). Thus, the final model can be defined as follows:

$$ROSt = (-0/587) + (0/051) * SIZE + (0/499) * ROA$$

The main hypothesis is not confirmed. This means that there is no significant relationship between intellectual capital and growth rate.

importance to intellectual capital in order to increase growth and return on equity. The research results show that there is no significant relationship between intellectual capital and sales growth rate. Therefore, it is necessary to use intellectual capital and its constituent elements (human, structural and relational capital) to increase the sales of a company. Accounting studies often are post-hoc studies. Therefore, it is usually not possible to be present at the time of the occurrence of variables. Although we must admit that it is not possible to control variables completely in any study - even in experimental sciences.

6. Conclusion

The results show that there is a significant relationship between intellectual capital and return on equity. Administrators are advised to attach great

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