

The Impact of Intellectual Capital on the Financial Performance of Listed Companies in Tehran Stock Exchange

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Abstract *In the age of knowledge-based economy, an organization uses two distinguished resources for value creation and profit making: material or tangible resources and intellectual or invisible resources. In fact, it is claimed that intellectual capital can explain better the material and physical capital and a company's performance financial indices. Intellectual capital provides a new complete model for observing organizations' real value and by using it; a company's future value can be calculated. The objective of the present study is to investigate the influence of intellectual capital on financial performance of the listed companies in Tehran Stock Exchange. In order to assess the intellectual capital, the value added intellectual capital coefficient developed by Palyk was used, which is one of the most important and valuable methods of assessing intellectual capital. In the present study, the influence of intellectual capital indices (efficiency of human, structural and physical capitals) on financial performance (earnings per share and the efficiency of assets) for 70 companies during the years 2004 to 2007 was investigated using the panel data regression. By reviewing the literature, four hypotheses were proposed. The results obtained from testing the hypotheses showed that intellectual capital has positive and significant influence on earnings per share and the efficiency of assets. The results of regression models show that intellectual capital has positive and significant influence on earnings per share and the efficiency of assets. Structural capital like other components of intellectual capital also has significant and positive on the efficiency of assets. The results also indicate that the negative influence of structural capital on earnings per share, however, because this influence is not significant enough, it can be neglected. The results of the approach of panel data are indicative of the significant influence of physical capital on earnings per share and the efficacy of assets. Therefore, increase in physical capital results in improving the financial performance of the studies companies.*

Key words Intellectual capital, human intelligence, structural capital, financial performance

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1. Introduction

In today's knowledge based on economy, intellectual capital and more important value than physical assets are considered for organizations and businesses and the sense of intellectual capital as a strategic component of real capital and the capital of contemporary organizations, especially organizations, research centers and foundations of knowledge. Intellectual capital is born in the realm of science (Sanchez, 2010).

In the knowledge-based economy, the intellectual capital of the organization is to create value in today's world; the success of any organization depends upon the ability to manage these assets. Today, the growing importance of intellectual capital as an effective tool is for enhancing the competitiveness of our companies. Measuring intellectual capital in order to compare different companies is necessary to determine their true value and improve their controls. Knowledge of today's top tools of economics is, where heroic acts economics, science and technology, there is increasing use of information. Knowledge-based companies have a large proportion of their investments in intangible assets and for finance and accounting management for companies that traditionally have Unobtrusive performance in different financial situations did not reflect a real challenge of remains (Seetharaman, 2002). Longer tangible riches and natural assets of communities and organizations are keys of success. But having been in the field of intellectual capital management and capital turbulent environment is a key challenge. Required to

administer and managing its tangible assets has already shown. Intellectual property is the most important part of corporate knowledge which is needed to identify and measure assets on a company's position in the international arena and are very effective in determining a company's value. These assets create long-term competitive advantage for companies that have an important role. The companies that are able to recognize and manage their assets well, they will have a better performance than their competitors. In other words, the asset management business to succeed in today's competitive world of work is undeniable. Intellectual capital is a topic that deals with the management and administration of assets (Mavridis, 2005). Changes in the management of public funds and securities in the global economy and the economy of the manufacturing sector to the service sector and public financial management based on intangible resources, increased attention to knowledge and intellectual capital and corporate performance is its ability and the relationship between financial performance and firm performance in emerging and developing economies has received much attention (Lim, 2004).

- Ghorbani and associates (1383) in a study entitled the Impact of intellectual capital on the financial performance of the pharmaceutical industry in Iran that was conducted on the 22 pharmaceutical companies.

It Concluded that the optimum and efficient use of company resources and intellectual impact on their profitability index. Also, negative impact on productivity and efficiency of human capital, structural capital efficiency has a positive impact on equity.

-Hemmati and Mehrabi (1387) in a study entitled to examine the relationship between intellectual capital and financial performance of listed companies in Tehran Stock Exchange 146 companies listed on the Stock Exchange was conducted that the relationship between the rate of growth of intellectual capital and the company's future performance.

- Tan and colleagues in a study that began in 2007 was conducted to examine the relationship between intellectual capital and financial performance of 150 firms between 2000 and 2002, the Singapore Stock Exchange. The results were remarkable in several parts. Including intellectual capital and financial performance of firms are positively correlated in a meaningful way. Future performance and growth as well as intellectual capital and intellectual capital were positively associated with firm performance. On the other hand, the contribution of intellectual capital on firm performance varied industries.

- Chen and colleagues (2006) have examined the relationship between intellectual capital, market value and financial performance of companies in Taiwan's stock market during 1992 and 2002. The results indicated a positive effect on intellectual capital, financial performance and market value of the company. This research also showed that intellectual capital can be used as an index for predicting future financial performance. Perskil (1994) believes the lack of success of learning, failed and it is associated with the continuous development of employees and organizational learning. His model of organizational learning in order to get a real idea of creating a learning organization should be taken and re-examine the definition of organizational learning and emphasized on human resource development practitioners role in the improvement and success of organizational learning.

-Two researchers, namely Lu and Radha Krishnan (2006) measure of organizational capital through sales patterns as a function of institutional investors, the company's net would have fixed assets, number of employees and capital, research and development, expansion. They surveyed about 250 companies showed that transcends organizational capital assets that will be estimated market value and growth potential for the company's position in particular. Based on research conducted among 500 Taiwanese companies, market value (real) company book value gradually has increased from 1 to more than 5-fold between 1997 and 2001. Studies have shown that about 80% of the company's market value is not reflected in their financial reports. This study examines the impact of intellectual capital on the financial performance of listed companies which has been paid in Tehran Stock Exchange of structural capital, human capital and physical capital. Therefore, the importance and necessity of research has become increasingly important due to the lesser-known assets (intellectual capital) is the true value of companies and their financial performance and consequently the success and failure in today's complex and competitive environment.

2. The research framework

2.1. Intellectual Capital

Different authors have interpreted the term in various ways, but the most commonly used means of this word is packed with useful knowledge. Conceptual knowledge here should be interpreted quite broadly. Processes, information systems, new products have been introduced to, trade names, customer lists and staff skills can all be part of the intellectual capital. Intellectual capital, knowledge inventory is an organization at a particular point in time there. Intellectual capital includes all sources of knowledge is central to the production values, but they are not entered in the financial statements. In other words, intellectual capital consists of knowledge, to apply experience, organizational technology, customer relationships and supplier and professional capabilities that create a competitive advantage in the market, it is going to the Hall of intellectual capital may be classified as assets (Such as brands, trademarks, contracts and databases); As is known or skills (such as knowledge workers know how to do that) or the company's organizational culture as Askandaya said: the components of intellectual capital indicator is for future value of the company and the company's ability to achieve the financial results, (Beram Handkar, 2007). Intellectual capital is a set of knowledge-based assets that are specific to an organization and among its features are through adding value to the organization's key stakeholders, to significantly improve the competitive position of leads (Mar, 2004). Dimensions of intellectual capital are: 1 - human capital: human capital as defined in individual knowledge, skills, abilities and experience of staff in an organization to create value and solve problems of organization. (Mavridis, 2005) Stewart(1997), the three components of intellectual capital is defined into human capital (the capacity to do things in different situations, to create tangible assets and intangible assets, capital structure (royalty, concepts, models and systems office computer) and relational capital (relationships with raw material suppliers and customers)."Intellectual capital is an asset; the enterprise's ability to create wealth is measured. The objective nature of the physical asset and an asset that is invisible can be achieved through the use of related assets, human resources and organizational performance relationships outside the business. All these features create value within organizations and earned value because it is a completely internal, merchantability (Chen *et al.*, 2008).

2.2. Elements of intellectual capital

In general, researchers and those involved in the field of intellectual capital on this thing believed that the intellectual capital of three human capital, structural capital and relational capital, which may be explained as follows:

A) Human Capital: Roos *et al* (1997) argue that employees' intellectual capital is to develop through competence, attitude and intellectual agility to develop. The most important elements of human capital enterprise workforce skills sets on, depth and breadth of their experience. Human resources can be regarded as spirit, mind and intellectual capital resources. The capital's night out would remain unchanged, but leave the employees of the company, structural capital and relational capital even leave in the night. Human capital consists of: a) the skills and competencies of the workforce b) their knowledge in areas that are critical to business success, and c) the talents of their conduct.

Brookings (1996) argues that human assets of an enterprise, including skills, expertise, abilities, problem solving and leadership styles. If an enterprise-level staff turnover is high, it may mean that the organization of this important component of your intellectual capital is lost.

B) There is other capital relational which includes all relationships between business relationship with any person or business. These include clients, intermediaries, employees, material suppliers, regulatory authorities, creditors and investors. The links are divided into two groups: Group A squeezed through contractual relationships which are recognized with customers and raw material suppliers or partners. The second group includes informal relationships, investors relationship as a bridge and as the organizer of the intellectual capital and intellectual capital has become a decisive factor in market value. This investment includes the strength and loyalty of the customer relations. Customer satisfaction, financial health and price sensitivity may be used as indicators of this type of investment. A breakdown of the relationship between human capital and structural capital indicates that the business is worth. Trademarks, company reputation, or goods and services, which reflect relationships between companies and customers (potential or actual), they also fall into this category of assets.

C) Capital structure: Roos *et al* (1997) argue that structural capital includes the stocks of such inhumanity, data base, organizational charts, process instructions, strategies and program administration. A wide range of structural capital will cover the essential elements. The most important, they usually include: 1) implementation of business processes, 2) how to structure 3) policies, information flows and database 4) leadership and management style 5) organizational culture, and 6) the employee reward's plan (Holman, 2011).

2.3. Position from the perspective of intellectual capital experts

The various definitions of intellectual capital experts:

1. Stuart believes the intellectual capital are a set of knowledge, information, experience, intellectual property, competition and organizational learning that can be used to create wealth. The intellectual capital of its staff, organizational knowledge and skills it takes to create added value and lead to sustained competitive advantage (Seetharaman, 2002).

2. Bontis: intellectual capital is achieved as a set of intangible assets (resources, capabilities, competitive) defines organizational performance and value creation. (Bontis, 1998)

3. Advynsvn and Malone, Intellectual Capital defined as "information and knowledge applied to work to create value".

4. Bontis and Holland, in his article in 2002, to the intellectual capital they define intellectual capital reserve of knowledge in a certain point of time in an organization. It defines the relationship between intellectual capital and organizational learning has not been studied.

5. Intellectual capital assets is measured that an organization's ability to create wealth. The objective nature of the asset is achieved in an intangible asset that is not physical assets through the deployment of human resources, organizational performance and relationships outside of the organization is. All these features make the value obtained for a purely local phenomenon, merchantability (Bontis and Keow, 2009).

2.4. Financial performance

Accounting and financial evaluation criteria play an important role in evaluating corporate performance, but selecting an appropriate measure of the issue that has caused a lot of research in the management literature. In today's competitive world, creating value for shareholders wealth is one of the main goals of each individual investor or investment firm. Investors who wish to increase their capital every day to maximize, so look for investment opportunities that will create more wealth for them. Public opinion, the most important financial objective of a business unit, maximizing shareholder wealth is obviously, that each business unit stakeholders such as customers, management, employees, creditors, banks and governments have their own goals, these goals can be financial and nonfinancial nature. But in between, influential interest groups influencing the company's shareholders are senior managers are usually chosen by the board to be removed and installed. Shareholder value over the last few years has grown to managing the organization's financial strategy plan. Also concerns about the inherent limitations of the importance of the traditional performance evaluation criteria that will ultimately lead to poor financial decisions can be made most criticisms raised against these criteria. In recent years, the concept of economic value added, market value added as main indicator of financial performance and shareholder value has been considered by many researchers and support. Various aspects of economic value added, market value added, such as different ways to calculate them, and link them to other financial concepts such as net present value. Basically, the criteria for assessing the performance of companies in the capital market were raised into two categories, traditional values and value-based criteria are divided the use of traditional assessment criteria, including corporate income, earnings per share, cash flow and capital market so the consecutive years has been used to, value-based criteria for evaluating the performance of these enterprises. Traditional methods of performance evaluation are given only to the accounting profit due to the lack of consideration of the cost of capital supply companies are not in an agreeable manner. Based on these criteria the return value of the company depends on the company and the cost of capital. (Kannan, 2004).

2.5. To obtain a representative indicators of financial ratios

Preparing financial statements, financial data analysis is the most commonly used one. Each group of users of financial statements is to evaluate the success of any activity in the stock market from your perspective. One of the criteria for success in an industry or activity is financial ratios. This ratio, in fact, is abstract financial reports of companies that provide much information about the situation within the company. Financial ratios, is good indicators for measuring the performance and financial position of firms. These ratios can be classified based on the information provided. There are different categories of financial ratios. But a general classification than other classification systems have been used in different contexts financial ratios is categorized in five groups as follows;

1-Liquidity 2 - Leveraging 3 - 4 market values - Activity 5 – Profitability

Liquidity ratios can be used to evaluate a company's ability to fulfill short-term liabilities. Leverage ratios, debt payment obligations and the company's ability to assess the maturity. Market value ratios, which are measures of market price and book value per share and profit communicators. Efficiencies, asset management perspective, using the measured activity ratios and those of the financial ratios of the company's operations (net profit, gross profit, operating profit, profit before interest and taxes EBIT) from different perspectives (sales, assets) are reviewed, called Profitability Ratios. In this research, financial ratios (according to Table 1) are used to evaluate financial performance. In this table, the proportions of the plus sign (+), they are items of interest, It means that the higher the value, the better. Ratios with a negative sign (-), are the items of their low cost and desirable (Baltagi, 2005).

Financial Ratios, table (5.2.)

Ratio name	Type	Ratio Name	Type
Earnings per share (+)	Market Value	(Net working capital (+)	Liquidity
Price to Earnings (-)		Net working capital to total assets (+)	
Book Value (+)		Current ratio (+)	
Dividend yield (+)		Quick ratio (+)	
Dividends paid (+)		Debt ratio (-)	
P/B(-)	activity	Debt to equity ratio (-)	Leverage
Turnover of accounts receivable (+)		Read student interest expense (-)	Profitability
The average collection period (-)		Gross margin (+)	
Inventory turnover (+)		Net profit (+)	
Circulation of goods (-)		Total return on assets - ROA (+)	
Volume Operations (-)	Return on common equity - ROE (+)		
Turnover of total assets (+)		Equity turnover (+)	

Source: (Guthrie, 2011)

Certain financial ratios, are consistent with the pattern and structure therefore, the gray relation analysis is used for classification of financial ratios, so that in each category are financial ratios that are similar in characteristics. Then for each category, will be an index that measures the financial performance representation obtained in this study. The gray relation analysis theory is proposed by Deng in 1989. Information gray ones that are incomplete or unknown. Grey relation analysis method to determine the relationships between the information. Grey relation analysis method to determine the relationships between the information. First, financial ratios, are normal. If you are among the items of financial ratios are positive, the formula (1) If one item is negative, the formula are used (2) for balancing amounts of financial ratios are used (Guthrie, 2011).

$$y_i(k) = \frac{x_i(k)}{\sqrt{\sum_{t=1}^m [x_i(t)]^2}} \quad (1)$$

$$y_i(k) = \frac{1/x_i(k)}{\sqrt{\sum_{t=1}^m [1/x_i(t)]^2}} \quad (2)$$

In the above formulas, $y_i(k)$ is the normal amount of financial ratios i ($i = 1, 2, \dots, s$) for firm k ($k = 1, 2, \dots, m$) is. M represents the total number of firms is investigated. Then for any company, from financial ratios normalized using the formula (3) can be achieved in two by two.

$$\Delta_i(k) = |y_0(k) - y_i(k)| \quad (3)$$

Any financial ratios normalized to the reference interval ($y_0(k)$), and the distance that can be achieved in other ratios. Grey relation is obtained to formula (4).

$$\gamma(y_0, y_i) = \frac{1}{m} \sum_{k=1}^m \gamma(y_0(k), y_i(k)) = r_{0i} \quad (4)$$

In formula (4) of the formula (5) is calculated.

$$\gamma(y_0(k), y_i(k)) = \frac{\min_i \Delta_i(k) + \zeta \max_i \Delta_i(k)}{\Delta_i(k) + \zeta \max_i \Delta_i(k)} \quad (5)$$

In this formula, called the segregation index value is between zero and one ().

Using the above relationships can be gray relationship matrix ($R = (rij)$) obtained financial ratios related to the binary matrix form shows. In this matrix, $i = 1, 2, \dots, s$ and $j = 1, 2, \dots, s$, and s represents the total number of financial ratios. After calculating the matrix R , the following definitions are used for clustering financial ratios (Flamholtz, 1985).

Definition 1: If $rij \geq r$ and $rji \geq r$, then financial ratios Y_i and Y_j are belong to one cluster. r is the clustering threshold.

Definition 2: If $rij \geq r$ and is $rji \geq r$ and $rik \geq r$ and $rki \geq r$, but $rjk < r$ or $rkj < r$, if $\min\{rij, rji\} \geq \min\{rik, rki\}$, then Y_i and Y_j are in one cluster.

Definition 3: When Y_i and Y_j belong to a cluster, if $rij \geq rji$, then the representative of the cluster financial ratios i .

Definition 4: When Y_i, Y_j and Y_k are in a cluster, the cluster represents with the values of the index ($rij + rik$), ($rji + rjk$) and ($rki + rkj$). If the three quantities, ($rij + rik$) is the maximum value, indicating the index cluster, i is a financial ratio (Hsiao, 2003).

3. Research purposes

1. The effect of the structure of intellectual capital on the financial performance of listed companies in Tehran Stock Exchange
2. The Effect of human intellectual capital on the financial performance of listed companies in Tehran Stock Exchange
3. The effect of physical capital, intellectual capital on the financial performance of listed companies in Tehran Stock Exchange

4. Hypotheses

1. The intellectual capital, structural capital on the financial performance of listed companies in Tehran Stock Exchange has an effect.
2. Human capital, intellectual capital on the financial performance of listed companies in Tehran Stock Exchange has an effect.
3. After physical capital, intellectual capital on the financial performance of listed companies in Tehran Stock Exchange has an effect.

5. Materials and Methods

In this study, the purpose of this research which has been used is descriptive - survey. The study period from 1383 until 1386, and the statistical study of all companies listed on the Tehran Stock Exchange. The following constraints have been considered in the sample selection.

1. Fiscal year end is 29 March
2. Not negative equity
3. Change Research during the financial year and the trading halt should not be more than three months.
4. Component of investment firms, brokerage, leasing and not the bank.
5. Complete information is required about all the variables in this study.

Due to the limitations described in this study included 70 companies. The data in this study extracted to analyze the relationship between the data required by the Stock Exchange of information in libraries, financial reports and statements by listed companies In Stock. For analysis was used of test data to determine whether money or panel models, fixed effects, random effects models, Hausman test, Palyk model.

6. Results

6.6.1. The main hypothesis

The underlying assumption of this study was to investigate the relationship between intellectual capital and corporate stock that the results can be seen in the following table.

Table (4-13), the main research hypothesis test results

Significant	influence	The underlying assumption
(Significant (accept default	positive	Intellectual capital ratio has a significant effect on earnings per share
(Significantly (by default	positive	Intellectual capital has a significant effect on the rate of return on assets

6.6.2. Sub-hypothesis

Secondary hypotheses of this study include the impact of human capital, intellectual capital and physical capital on the financial performance of companies in stock.

Table (4-14) secondary research hypotheses test results

(Significantly (by default	influence	Auxiliary assumptions
(Significantly (by default	positive	Efficiency of human capital has a significant effect on earnings per share
(Not significant (assuming rejection	positive	Efficiency of human capital has a significant effect on asset returns
(Significantly (by default	positive	Performance of physical capital has a significant effect on earnings per share
(Significantly (by default	positive	Performance of physical capital has a significant effect on asset returns
(Not significant (assuming rejection	negative	Efficiency of structural capital has a significant effect on earnings per share
(Significantly (by default	positive	Performance influences the efficiency of structural capital assets

7. Conclusion and suggestions

They have attracted increasing gap between the actual value and the corporate office, according to the researchers explained in the financial statements of the unseen deletion. We talk about it as the value of intellectual capital and knowledge which is present in all aspects of such a body. Become increasingly important but is ignored when it is known that less capital (intellectual capital), the real value of companies and their financial performance and consequently the success and failure in today's complex and competitive environment plays an important role. Be given greater emphasis on intellectual capital in organizations and understanding the significance and impact of these factors on the overall performance of the organization and its positive impact on the value creation process in organizations as a factor influencing Improve the financial performance of organizations. As was seen in the previous part of intellectual capital stock has a positive impact on firms' performance. In fact, the components of intellectual capital, especially human capital and physical capital have a significant positive impact on financial performance. So companies surveys can provide through more investment and increase the efficiency of these two factors to increase earnings per share and return on assets. Explaining the importance of knowledge management and its impact on organizational performance largely depends on

the strength experiment that explains its role in the competitiveness of the organization and gain a larger share of it. One of the most reasonable approaches to the assessment of impact of intellectual capital on organizational performance through measurements of intellectual capital in an organization's overall performance is measured, that would be in an organizational level or at the level of individual processes and projects. The meaning of this phrase is that it should open up in a row to the other rows measurements yield a value of intellectual capital and intellectual capital contribute a certain amount to be considered, doing this is very hard to although in practice. Another important organizational orientation using traditional financial measures such as returning of capital to the value-based measures is such as economic value added, market value added. On the other hand the intellectual capital should be used for financial and non-financial metrics and measurements systems used a cloth. One of the non-financial measure of intellectual capital as a debit item is considered to convert an intangible asset and its value in terms of financial returns will be measurements. Thus helps administrators of intellectual capital growth or decline in capital view of the issue.

In the end, indexes of intellectual capital should be derived from the company strategy is important and useful intellectual capital can be seen in (It should be the intellectual capital of the company to note). In fact, the strategy of a company, the importance of intellectual capital components and their interrelationships through strategy map is defined and described.

According to the research results, suggestions are provided as follows:

1. Create a separate business units for measurement and management of intellectual capital for the benefit of the intangible assets, gain higher financial performance is suggested.

2. Note that corporate managers to strengthen the capital structure. Structural reform, the reform processes, comply with regulations, operational programs, strengthen governance, reform, infrastructure, improvements in organization and working methods of gaining trademarks innovative initiatives to strengthen the capital structure is effective and thus on the improvement of function indices future financial aid.

3. Companies can be non-material intangible assets include intellectual capital (human, structural and customer) to calculate and report capital market. Prompt reporting will help intangible assets on the balance sheet to balance sheet valuation of real stock market analysts.

4. Benefit shareholders (investors) in the use of evaluation model, the evaluation true and coming companies (based on intellectual capital) in order to obtain higher financial performance in the future.

Organizations need to exchange with experts and other analysts to value companies based on intellectual capital measurements. Part of the commission's board is to reinforce the value of the intellectual capital of the subsidiary.

Capital losses if the market did not disclose this type of information, capital, intellectual capital is an important indication. Examples of these losses are:

1. Shareholders may be longer than the access to information relating to intangible assets are denied in private meetings with large shareholders may be held.

2. If the managers of information derived from internal decisions regarding the use of intangible assets without informing other investors who traded on confidential information increases the likelihood of it.

3. Risk of improper valuation of companies is increasing and this makes bankers and investors more risk level for organizations to consider about it.

4. Cost of capital increases. If disclosure of such information due to the uncertainty regarding the future outlook, a more accurate assessment of the company is to operate and the cost of capital falls.

According to the present results the components of intellectual capital impact on the company's financial performance and efficiency therefore, corporate managers should be vigilant in order to boost capital to strengthen them, in accordance with the results obtained in order to investigate the influence of this comparison would effect on recent decades, with particular attention to the measurements of intellectual capital and to provide reports to stakeholders expressed frustration are in trying to find a way to assess intangible assets intangible value of domestic mining and extracting tangible value. In fact, the intellectual capital of a new model perfect for organizations that provides real value and can be used to calculate the performance and future value of the company.

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