

# The Impact of Intellectual Capital on the Profitability Ratios in Petroleum Products Industry in T.S.E

Hamid Saremi, Behrad Moein Nezhad, Abdullah Habibi Moheb Saraj

**Abstract:** *The purpose of this article has been the study of the intellectual capital and its components (structural, physical and human capital) on the petroleum products industry profitability ratios (return on assets, returns on shareholders' equity, profit margins and net profit growth rate) in petroleum products industry sector with in Tehran stock Exchange, controlling size and the financial leverage. With using pulic 2000 model 9 companies during 2009-2013 (45 companies years) have been analyze. The results show there is a significant relation between the intellectual capital variables and its components with ROA, ROE, profit margin and net profit growth rate. without exerting the controlling variables also there no significant relevant bet wen Intellectual capital relation with net profit growth rate, the physical capital with ROA and the human capital with the net profit growth rate, and the structural capital with ROE, the profit margin and the net profit growth rate.*

**Keywords:** *ROA, ROE, (structural, physical and human capital), (45 companies years).*

## I. INTRODUCTION

In the world of today's economy that the movement is from industrial economy to the knowledge-based economy, identification, valuation and intellectual capital management have turned into a very important and vital case for the companies. Considering the income resources in the country budget, which is based on the petroleum industry, studying the intellectual capital in the petroleum products industry is an important discussion.

Continuous research and development with the purpose of covering the society requirements and effort to discover the phenomena and creating innovation has always been a motivating element. On this basis, the research centers and managerial method are constantly being enhanced and improved (Moosai et al. 2009). Nowadays, the organizations competitive advantage is raised for the development of knowledge effectiveness as a valuable and strategic source and also an asset, providing services and products with an appropriate and economical quality is a difficult and impossible case, without management and through using this valuable source. In this approach, knowledge like a valuable source as well as the labor sources, land and capital, which has formerly been considered in the economics, have been raised. In such structures, industry is not an axis anymore,

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**Hamid Saremi**, Department of Accounting, Quchan Branch, Islamic Azad University, Quchan, Iran.

**Behrad Moein Nezhad**, Young Researchers and Elite club, Quchan Branch, Islamic Azad University, Quchan, Iran.

**Abdullah Habibi Moheb Saraj**, Young Researchers and Elite club, Quchan Branch, Islamic Azad University, Quchan, Iran.

But the axis is the knowledge in which the knowledgeable workers are engaged working and subsequently works in the organizations are changing to knowledgeable works. Evaluation of the causes of the increasing gap between market value and the companies' book value forms the foundation of the intellectual capital research, which due to the restrictions in the financial statements, they lose their value benefit and information effectiveness, while their importance in increasing the shareholders' wealth, achieving sustainable profitability, the increase of the companies' share from the global markets, evaluation of the current performance of the commercial units and also the future prediction has always been taken into consideration (Demurray et al. 2012). Considering the valuable role of petroleum industry as one of the foundations of the country and the important lever of the country's growth and development, in this research the intellectual capital in this industry will be studied.

The knowledge assets and intellectual capital are changing to a strategic lever to manage the business performance, so the companies are forced to create added value, in order to stay in the new economy

The present accounting systems do not have the ability to calculate and measure the knowledge considering its highlighted role in the evaluation of the commercial unit's performance and the organizations, which have underestimated the consideration to the knowledge in the management and administration of the company, will always encounter problems in the continuation of their activities (Noori & Broojerdi, 2010).

## II. STATING THE ISSUE

In knowledge-based economy, the intellectual capital is used to create the value for the organization and in today's world, the success of any organization depends on the ability to manage these capitals, considering the change in the today's economy world and moving from the industrial economy towards the knowledge-based economy, identifying, giving value and managing the intellectual capital has turned into a very important and crucial issue for the companies. The managers should be aware of the existing intellectual capital in the company, so that they can optimally manage the intellectual capital of the company. The financial statement users should also be aware of the intellectual capital rate, so that they can predict the future of the company and make knowingly decisions, therefore, identifying and appropriate and right decisions of the intellectual capital of the companies is both an essential issue for both the financial statement users and the managers, which its importance is increasing day by day (Talebniya, 2012).

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In traditional accounting, there are restrictions for intellectual capital disclosure and reporting, because most kinds of intellectual capital cannot be shown in the balance sheet, instead the costs spent for the intellectual capital are directly considered as the current costs in the form of profit and loss account. Knowing these costs as expenditures promptly causes to reduce the current profits and distort the financial situation of the organizations. The main problem in reporting the intellectual capital is related to the accounting standards, which bounds a company to consider one item in the assets account just in a case, when it has all the determined specifications in the standard. Considering these restrictions only cases such as: the key money, the research and development costs and other intangible assets (the invention patent, copy, soft wares and trade marks) are brought in the financial statements of the organization (Dastgir, 2009). The modern economical growth originates from the knowledge and information, this case causes the increase of the intellectual capital importance as a research and economical category. The role and importance of the intellectual capital share in the managerial, technical and social improvement, is a subject depends on its ability to create, store, distribute and apply the knowledge assets (Nikoomaram, 2010), on one hand, profit is considered as one of the important information in the economical decisions. The studies and researches done on the profit form one of the most voluminous and the most research efforts in the history of accounting. Profit as a dividend payment guidance has always been used by the investors, managers and financial analysts as a management effectiveness and evaluation tool and a decisions predicting and evaluating means (Saghafi, 1994) and also the investors invest in the companies, which their profitability process has more stability. Therefore, the reported profits and the profitability ratios are taken into consideration as a fundamental factor in their study and judgments (Hassanzadeh brothers, 2012). This study is important because the profit and profitability ratios as an economical factor, which can have a role in the study of the intellectual capital, can be effective in policy making and the strategies of the managers and investors, will be studied. We are seeking to answer to this question that whether there is any relation between intellectual capital performance and profitability ratios in the petroleum products industry or not.

### III. THE THEORETICAL BASICS AND RESEARCH HISTORY OF RESEARCH

The term intellectual capital was first introduced by John Kenneth Galbraith (1996). Galbraith believed intellectual capital is an ideological process and includes the flow of thought. But Stewart (2001) claims that the issue was first raised in 1958, when he and Itami collaborated about intellectual capital movement with each other. In general, intellectual capital has more meaning than intelligence and it is associated with a degree of intellectual operation (Bonits, 1998).

The purposes that organizations have to measure the intellectual capital are as follows:

- 1- Helping the organization to formulize the strategies
- 2- To evaluate the way of strategy implementation

- 3- Contribution to expansion and diversification of the company's decisions
- 4- Intellectual capital non-financial evaluation can be related to the managers' bonus and repayments.
- 5- The promotion of internal management, the improvement of external reporting and the legal and trading incentives (Mar et al. 2008).

Despite the similarity of the intellectual capital with the tangible assets, in the potential abilities to create future cash flows, the intellectual capital are competitive assets. Unlike the physical capital, which can only considered for doing a specific task in a certain time, the intellectual capital can be used for several specific tasks, simultaneously (Talukdar, 2003). In the capital market, the investors' decisions are made, based on the information, which is provided to the market in various ways. This is while, the existence of some conditions in the financial reporting environment, makes it difficult to evaluate the quality of the information by the users (Nikkhah, 2008).

The company sources are considered as the most important competition and performance stimulus. Such kind of sources are used in an effective and efficient way in the direction of implementing specific profitable and competitive strategies. The intangible factors in an effective and efficient way towards the implementation of certain profitable and competitive strategies provide for the company, the required ability to conduct the strategic programs. The concept of intellectual capital is one of the richest explanation frameworks in the contemporary management, economical and sociological considerations. This context has undergone transformations during the recent decades, which because of them; we have witnessed the emergence of new theories of cultural, human, intellectual and organizational capitals (Jafari nejad, 2008).

The researchers have different definitions of intellectual capital: Stewart believes that intellectual capital is a collection of knowledge, information, intellectual assets, experience, competition and organizational learning, which can be applied to create wealth. In fact, the intellectual capital includes all the staff, organizational knowledge and in its abilities to created value added and causes sustainable competitive benefits (Ghelich khani and Moshabbaki, 2006). Intellectual capital includes all the processes and assets, which have not normally and traditionally reflected in the companies' balance sheet and are usually studied in 4 human realms (competence, intellectual trends and intellectual creativities), structure capital (executive processes), spiritual rights (cultural assets) and communicative capital ( trading relationships with the partners, clients, providers, the shareholders' raw materials and good reputation), (Sepehr doost, 2011).

Intellectual capital is an asset, which measures the organization ability to create wealth. This capital does not have physical and objective nature and it is an intangible asset, which has been achieved through applying the assets related to the human resource, organizational performance and the relationships out of the organization. All these characteristics cause value creation inside the organization and this achieved value, because of being a totally internal phenomenon, does not have the ability to buy and sell (Dastgir, 2009).

Most of the researchers have divided the intellectual capital into three components:

**1- Human capital:**

According to Ross et al definition (1997), the staff of an organization, create the intellectual capital through their competences, viewpoints and intellectual brilliance, these competences include: the staff’s skill, education and the way of thinking, which covers their behavioral components (Karimi, 2009).

**2- Structural capital:**

According to Bontis et al (2000) define the structural capital including all the non-human knowledge reservoirs in the organization, which include: input base, organizational charts, processing instructions, guidelines and everything, which gives to the organization, more value than its tangible assets (Karimi et al. 2009).

**3- Communicative capital:**

It is a collection of assets, which organize and manage the mutual relationships with the environment. This capital includes the relationship with the customers, shareholders, providers, competitors, government, governmental institutions and the society (Monavariyan et al., 2006).

Explanation of the knowledge management importance and its impact in the organization performance largely depends on the justification power and its role definition in increasing the organization competitive power and getting a greater share of the organization. One of the most logical approaches in this field is measuring the intellectual capital impact on the organizations’ performance through measuring the intellectual capital in the measuring system of the general performance of the organization (Namamiyan, 2011).

In this research, to measure the intellectual capital, value added coefficient is used. Paleek (1998, 2000, 2004) in favor of Grascania guidance method, has expanded the analysis of the efficiency of the value creation, which is called VAIC (value added intellectual coefficient), and its

purpose is measuring the human resource efficiency in the organization through the annual reports.

**IV. INTELLECTUAL CAPITAL MEASUREMENT METHODS**

According to Williams’ view point (2002), different methods can be placed into four main groups:

1- Intellectual capital direct methods: they include the estimated monetary value of the intangible assets or the intellectual capital, through identifying their various constituent elements. According to these methods once the elements’ value is calculated individually and then their different levels total value indicates the related assets value.

2- The methods of investment market (methods of the capital market formation).

Calculating the difference between company market values (on the basis of stock market) and the adjusted shareholders’ equity for the inflation or the substitute cost as the intellectual capital value or intangible assets is taken into consideration.

3- The return on equity method: It is better to bring this part in the form of formula.

Calculating the average profits before deducting the company’s several years’ tax and dividing it by the average tangible assets of the company in those years, the result of this calculation is called the capital return rate, which is compared with the industry average, the difference between these two figures, multiplies the average tangible assets, so that the average annual revenues obtained from the intangible assets is gained. Then this average income obtained, is divided by the average weight of the capital cost or the interest rate, so that through this way an estimation of the intangible assets value or intellectual capital is gained.

4- Score card method: Score card methods are used when the intellectual capital different components are specified and they can be reflected by a score card or a graph.

**Internal researches:**

Research results	Subject	Year	researchers
It has had a positive impact between the Board of directors’ members & the companies’ intellectual capital.  While, there has been no meaningful relationship between 2 variables of the non-bound members percentage to the total members of the Board of directors and the Board of directors’ ownership percentage on the intellectual capital.	Role of the Board of directors structure on the companies’ intellectual capital with the phase approach of the case study of the pharmaceutical companies	2012	Ahmad poor et al
There is no meaningful relationship between the intellectual capital efficiency coefficient and the market value (the ratio of market value to the book value).  Also the intellectual capital efficiency coefficient has a positive & meaningful impact on the financial performance of the company (assets return rate.	The intellectual capital impact on the market value & financial performance	2012	Poor zamani et al

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There is a meaningful relationship between market value & intellectual capital & its components.	Definition of intellectual capital status in financial improvement of the companies accepted in Tehran stock exchange	2012	Demurray et al
There is a meaningful relationship between the profitability indexes and the intellectual capital performance.	The intellectual capital efficiency impact on the companies' profitability, the empirical research in Iran stock market	2012	Moradzadeh Et al
There is a meaningful relationship between profitability & the company's size & life cycle	Study of the profitability relationship with return by considering the company's size & life cycle	2009	Rahmani Et al

## Foreign research record:

Chung and Hessyeh (2011) studied the relationship between the intellectual capital components and three operational, financial and market performance in Taiwan stock market. The research results shows that the relationship between the operational performance and the applied capital is positive and it has no relationship with the structural capital and the human capital. Also the intellectual capital components have negative relationship with the financial and market performance.

Zigan and Malwell (2010) studied the intellectual capital impact on the economical performance (the ratio of operational profit to the total sale), the financial performance (return on equity) and stock exchange (the ratio of market value to book value). The research results indicates that the intellectual capital has a positive impact on the economical and financial performance, but the intellectual capital relationship and the market performance is only meaningful for the industries with high technology. Maditinos et al. (2010) studied the intellectual capital impact on the market value and the companies' financial performance. The research results indicates that there is only a meaningful relationship only between human capital and return on shareholders' equity rate and between other financial performance criteria (assets return rate and the revenue growth rate) with the intellectual capital there is no meaningful relationship, also between the intellectual capital and its components and the market value, there is no meaningful relationship. Apohami (2007) studied the relationship between the intellectual capital and the capital profit per share of the finance industry companies, banking and stock exchange insurance of Thailand. The research results indicate that between the intellectual capital (the components of the intellectual value added coefficient) and the capital profit per share, there is a positive and meaningful relationship.

**Research hypothesis: The hypotheses are written in a more briefly way.**

- 1- *There is a meaningful relationship between intellectual capital and return on assets.*
- 2- *There is a meaningful relationship between physical capital and return on assets.*
- 3- *There is a meaningful relationship between human capital and return on assets.*

4- *There is a meaningful relationship between structural capital and return on assets.*

5- *There is a meaningful relationship between intellectual capital and shareholders' return on assets.*

6- *There is a meaningful relationship between physical capital and return on equity.*

7- *There is a meaningful relationship between human capital and return on equity.*

8- *There is a meaningful relationship between structural capital and return on equity.*

9- *There is a meaningful relationship between intellectual capital and profit margin.*

10- *There is a meaningful relationship between the physical capital and profit margin.*

11- *There is a meaningful relationship between human capital and the profit margin.*

12- *There is a meaningful relationship between structural capital and profit margin.*

13- *There is a meaningful relationship between intellectual capital and net profit growth rate.*

14- *There is a meaningful relationship between physical capital and net profit growth rate.*

15- *There is a meaningful relationship between human capital and net profit growth rate.*

16- *There is a meaningful relationship between structural capital and net profit growth rate.*

## V. RESEARCH METHOD

This research according to division in terms of objectives is an applied research and its research type is correlation and in terms of methodology, it is a post-event research. The purpose of this type of researches is to study the existing relationships between variables and inputs from the environment, which in a natural form have been existed or they are collected and analyzed from the past events that without direct intervention of the researcher have occurred (Delavar, 2005).

**a. Statistical community, sampling method and sample volume:**

With regard to the nature of the research among the banks accepted in Tehran stock exchange and considering following conditions a number of 7 banks for 5 years (35 years of company) have been selected.

- 1) Have been accepted in the stock exchange, before 2008.
- 2) Their fiscal period ends to the end of March.

- 3) They did not have a fiscal change or discontinued operation during 2009 to 2013.
- 4) Financial statements with explanatory notes along with the companies in the mentioned return time, in a full form is available in the Stock exchange website.
- 5) The selected banks should be profitable.

**b. Research variables:**

A: The independent variable 1- Intellectual capital 2- Physical capital 3- Human capital 4- Structural capital  
 B: Dependent variable ( profitability ratios) 1- Return on assets rate (ROA) 2- Return on equity rate (ROE) 3- Profit margins (CM) 4- Net income growth rate (net income growth rate)  
 C: Controlling variable containing the financial leverage and the bank size

**c. Method of measuring the research variables:**

**Independent variable:**

To calculate the added value coefficient of the intellectual capital in accordance with Paleek model, the following steps should be taken:

- 1- Calculating the added value
  - R: (changes in retained earnings)
  - S: (net sales revenues)
  - B: (bought- in materials services or cost of goods sold)
  - DP: (depreciation)
  - W: (wages or employee salaries)
  - I: (interest expenses)
  - DD: (dividends)
  - T: (taxes)
- By putting the above formula in order the following equation will be obtained:  
 $S - B = DP + W + I + D + D + T + R$   
 $S - B - DP = W + I + D + D + T + R$  }  $VA = S - B - DP - W + I + T + NI$   
 $D + R = N$

2 - CE calculation (capital applied), HU (human capital calculation), SC (structural capital calculation)

To test the hypothesis the following models are used:

- CE – Net assets total value
- HU – All the expenses spent for the employees
- SC – Human capital – added value
- 3- Calculating VACE (value added of capital estimated). VAHU (value added of human capital) and STVA (structural capital value added):  
 $VACA = VA/CA$   
 $VAHU = VA/HU$   
 $STVA = SC/VA$
- 4- Calculation of intellectual capital added value:  
 $VAIC = VACA + VAHU + STVA$

**D. Calculation of the dependent variable**

- 1- To calculate the return on assets rate the following formula is used:  
 $ROA = NI/TA$  (A)  
 ROA = Return on assets rate NI = net income TA (A) = total assets (on average)  
 This proportion is the efficiency for using the assets and the net income rate per Rial shows the invested funds in the company
- 2 – To calculate the return on equity rate the following formula is used  
 $ROE = NI/SHE$  (A)  
 ROE = Return on equity rate NI = net income SHE (A) = shareholders' equity (on average)  
 This proportion is the efficiency for using the equity and the net income per Rial shows the shareholders' equity.
- 3 – To calculate the profit margin the following formula is used:  
 Income / operational profit = profit margin
- 4 – To calculate the net profit growth rate the following formula is used:  
 Base year net profit / previous year net profit = net profit growth rate  
 Calculating controlling variable:  
 1- Bank size (asset natural logarithm)  
 2 – Financial leverage (total assets / total liabilities)

Models	Hypothesis
$ROE = B_0 + B_1 VACI + B_2 SIZE + B_3 LEV$ $ROE = B_0 + B_1 STVA + B_2 VAHU + B_3 VACE + B_4 SIZE + B_5 LEV$	Hypothesis 1,2,3,4
$ROA = B_0 + B_1 VACI + B_2 SIZE + B_3 LEV$ $ROA = B_0 + B_1 STVA + B_2 VAHU + B_3 VACE + B_4 SIZE + B_5 LEV$	Hypothesis 5,6,7,8
$CM = B_0 + B_1 VACI + B_2 SIZE + B_3 LEV$ $CM = B_0 + B_1 STVA + B_2 VAHU + B_3 VACE + B_4 SIZE + B_5 LEV$	Hypothesis 9,10,11,12
$net\ income\ growth\ rate = B_0 + B_1 VACI + B_2 SIZE + B_3 LEV$ $net\ income\ growth\ rate = B_0 + B_1 STVA + B_2 VAHU + B_3 VACE + B_4 SIZE + B_5 LEV$	Hypothesis 13,14,15,16

**VI. METHOD OF ANALYZING DATA**

For the data statistical analysis and the current research hypothesis testing, of descriptive statistics (criteria average and deviation) and inferential statistics, through applying Panel Data method have been used. The separation correlation coefficients calculates the linear relationship between two variables through removing (control) the impacts of one or more additional variables are calculated to

test the variables are , independent and dependent variables, which for the research variables testing, once dependent and independent variables without controlling variable are tested, but in the other test, the dependent and independent variables combined with the control variable are tested, therefore, the research results once without control variable and the other time by considering the control variable, are tested.



Chapter one: Descriptive statics

Stretch	چولگی	Criteria diversion	Average	Maximum	Minimum	
-0.50	-0.94	0.26	0.71	0.97	0.19	Structural capital
0.79	1.28	12.63	13.04	51.04	2.08	Human capital
-0.92	0.55	0.29	0.44	0.98	0.10	Physical capital
0.73	1.26	12.81	14.19	52.47	2.79	Intellectual capital
1.40	1.32	0.20	0.26	0.87	0.02	ROA
1.10	0.83	0.23	0.45	1.20	0.12	ROE
0.49	1.07	0.19	0.26	0.76	0.02	Profit margin
20.88	-3.89	0.87	-0.15	0.99	-4.92	Profit growth rate
8.15	2.80	6915229/95	6033720/51	32543149	639731	Company size
0.23	-0.60	0.16	0.55	0.86	0.16	Financial leverage

**Part II: inferential statistics**

**Test results hypothesis: Regardless of the control variable**

1) There is a meaningful relationship between the intellectual capital and its components (physical capital, human capital and structural capital) and the return on equity of the shareholders

Structural capital	Human capital	Physical capital	Intellectual capital	Dependent variable: ROE	
0/085	0/143	0/236	0/152	Determination coefficient	Regression results
1/489	1/470	1/411	1/469	In between Watson	
0/052	0/010	0/001	0/008	Model meaningful level	
0/264	0/361	0/278	0/351	Width from origin	Beta coefficients
0/262	0/007	0/390	0/007	slope	
2/666	7/771	4/964	7/325	Width from origin	T statistics
1/996	2/679	3/644	2/772	slope	
0/011	0/000	0/000	0/000	Width from origin	Variables Meaningful level
0/052	0/010	0/001	0/008	slope	

According to the above table results, there is a meaningful relation between intellectual capital, human capital, physical capital and return on equity shareholders, which its meaningful level is respectively (0.008, 0.001 and 0.0010) and also between the structural capital and return on equity of the shareholders, there is no meaningful relationship.

2- There is a meaningful relationship between the intellectual capital and its components (physical capital, human capital, structural capital) and the return on equity.

Structural capital	Human capital	Physical capital	Intellectual capital	Dependent variable: ROA	
0/145	0/114	0/034	0/119	Determination coefficient	Regression results
1/801	1/723	1/665	1/724	In between Watson	
0/01	0/023	0/226	0/02	Model meaningful level	
0/045	0/191	0/204	0/184	Width from origin	Beta coefficients
0/305	0/005	0/131	0/005	slope	
0/53	4/546	3/64	4/235	Width from origin	T statistics
2/706	2/355	1/228	2/409	slope	
0/599	0/000	0/001	0/000	Width from origin	Variables Meaningful level
0/01	0/023	0/226	0/02	slope	

According to the above table results, there is a meaningful relation between intellectual capital, human capital, structural capital and return on assets, which its meaningful level is respectively (0.02, 0.0023 and 0.001) and also between the physical capital and assets return, there is no meaningful relationship.

3) There is a meaningful relationship between the intellectual capital and its components (physical capital, human capital and structural capital) and the profitability ratios.

Structural capital	Human capital	Physical capital	Intellectual capital	Dependent variable: profit margin	
0/001	0/231	0/228	0/236	Determination coefficient	Regression results
0/587	0/820	0/796	0/823	In between Watson	
0/802	0/001	0/001	0/001	Model meaningful level	
0/240	0/164	0/118	0/156	Width from source	Beta coefficients
0/029	0/007	0/324	0/007	Slope	
2/743	4/418	2/470	4/059	Width from source	T statistics
0/252	3/599	3/567	3/642	Slope	
0/009	0/000	0/018	0/000	Width from source	Regression coefficient meaningful level
0/802	0/001	0/001	0/001	Slope	

According to the above table results, there is a meaningful relation between intellectual capital, physical capital, human capital and profit margin, which its meaningful level is respectively (0.001, 0.001 and 0.0001), also between the structural capital and equity shareholders, there is no meaningful relationship.

4) There is a meaningful relationship between the intellectual capital and its components (physical capital, human capital and structural capital) and the net profit growth rate.

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Structural capital	Human capital	Physical capital	Intellectual capital	Dependent variable: Profit growth rate	
0/002	0/067	0/103	0/070	Determination coefficient	Regression results
1/963	1/972	2/022	1/972	In between Watson	
0/794	0/085	0/031	0/080	Model meaningful level	
-0/245	-0/381	-0/577	-0/401	Width from the origin	Beta coefficients
0/136	0/018	0/973	0/018	Slope	
-0/625	-2/080	-2/514	-2/115	Width from the origin	T statistics
0/263	1/763	2/224	1/793	Slope	
0/535	0/044	0/016	0/040	Width from the origin	Regression coefficients meaningful level
0/794	0/085	0/031	0/080	Slope	

According to the above table results, there is no meaningful relation between intellectual capital, human capital, structural capital and profit margin, which its meaningful level is respectively (0.080, 0.0085 and 0.0794), also between the physical capital and equity shareholders, there is a meaningful relationship.

### Hypothesis testing results considering controlling variables:

1- There is a meaningful relation between intellectual capital and its components (physical capital, human capital, structural capital) and the return on equity of the shareholders.

Structural capital	Human capital	Physical capital	Intellectual capital	Dependent variable: ROE	
0/195	0/236	0/291	0/243	Determination coefficient	Regression results
1/529	1/460	1/500	1/458	In between Watson	
0/029	0/011	0/003	0/009	Model meaningful level	
0/524	0/558	0/511	0/539	Width from origin	Beta coefficient
0/000	0/000	0/000	0/000	Company size	
-0/360	-0/261	-0/352	-0/245	Financial leverage	
0/244	0/007	0/327	0/007	Independent variable	
2/683	3/669	3/533	3/498	Width from origin	T statistics
-1/650	-1/838	-0/464	-1/872	Company size	
-1/591	-1/136	-1/770	-1/066	Financial leverage	
1/596	2/209	2/896	2/305	Independent variable	Regression coefficient meaningful level
0/010	0/001	0/001	0/001	Width from origin	
0/107	0/073	0/645	0/068	Company size	
0/119	0/263	0/084	0/293	Financial leverage	
0/018	0/033	0/006	0/026	Independent variable	

As it can be seen in the above table, all the models have meaningful level less than 0.005, so by the impact of controlling variables, there is a meaningful relationship between intellectual capital, physical capital, human capital and structural capital with the return on the equity shareholders, which its meaningful level is respectively as follows: 0.009, 0.003, 0.011, and 0.029.

2- Between the intellectual capital and its components (physical capital, human capital and structural capital) and the return on equity, there is a meaningful relationship.

Structural capital	Human capital	Physical capital	Intellectual capital	Dependent variable ROA	
0/26	0/231	0/217	0/232	Determination coefficient	Regression results
2/163	2/071	2/12	2/068	In between Watson	
0/006	0/012	0/017	0/012	Model meaningful level	



0/381	0/51	0/554	0/503	Width from the origin	<b>Beta coefficients</b>
-3/285	-2/103	-3/027	-2/144	Company size	
-0/452	-0/492	-0/567	-0/486	Financial leverage	
0/208	0/003	0/046	0/003	Independent variable	
2/288	3/758	4/104	3/641	Width from the origin	<b>T statistics</b>
-0/764	-0/487	-0/071	-0/497	Company size	
-2/345	-2/399	-3/061	-2/359	Financial leverage	
1/601	0/944	0/432	0/979	Independent variable	
0/027	0/001	0	0/001	Width from the origin	<b>Meaningful level of regression level</b>
0/449	0/629	0/943	0/622	Company size	
0/024	0/021	0/004	0/023	Financial leverage	
0/117	0/351	0/668	0/333	Independent variable	

As it can be seen in the above table, all the models have meaningful level less than 0.005, so by the impact of controlling variables, there is a meaningful relationship between intellectual capital, physical capital, human capital, structural capital with the return on the equity, which its meaningful level is respectively as follows: 0.017, 0.012, 0.006, and 0.012.

3- There is a meaningful relationship between the intellectual capital and its components (physical capital, human capital and structural capital) and the profit margin.

Structural Capital	Human capital	Physical Capital	Intellectual capital	Dependent variable: profit margin	
0/519	0/575	0/552	0/575	Determination coefficient	<b>Regression result</b>
0/966	1/142	1/143	1/147	In between Watson	
0/000	0/000	0/000	0/000	Model meaningful level	
0/919	0/576	0/606	0/567	Width from source	<b>Beta coefficient</b>
0.000	0.000	0.000	0.000	Company size	
-0/914	-0/584	-0/706	-0/579	Financial leverage	
-0/167	0/006	0/186	0/006	Independent variable	
7/201	6/009	6/234	5/811	Width from source	<b>T statistics</b>
-2/008	-3/8	-2/226	-3/797	Company size	
-6/186	-4/034	-5/289	-3/98	Financial leverage	
-1/674	2/927	2/447	2/928	Independent variable	
0/000	0/000	0/000	0/000	Width from source	<b>Regression coefficients Meaningful level</b>
0/051	0/000	0/032	0/000	Company size	
0	0/000	0/000	0/000	Financial leverage	
0/102	0/006	0/019	0/006	Independent variable	

## The Impact of Intellectual Capital on the Profitability Ratios in Petroleum Products Industry in T.S.E

As it can be seen in the above table, all the models have meaningful levels less than 0.005, so by the impact of controlling variables, there is a meaningful relationship between intellectual capital, physical capital, human capital and structural capital variables and the profit margin, which its meaningful level in all variables is (0.000).

4- Between the intellectual capital and its components (physical capital, human capital and structural capital) and the net profit growth rate, there is a meaningful relationship.

Structural capital	Human capital	Physical capital	Intellectual capital	Dependent variable: net profit growth rate	
0/037	0/083	0/115	0/085	Determination coefficient	Regression results
2/038	1/979	2/059	1/979	In between Watson	
.664	.309	.168	.298	Model meaningful level	
0/603	-0/127	-0/271	-0/167	Width from origin	Beta coefficients
0.000	0.000	0.000	0.000	Company size	
-1/132	-0/316	-0/551	-0/286	Financial leverage	
-0/156	0/019	0/911	0/019	Independent variable	
0/746	-0/202	-0/444	-0/26	Width from origin	T statistics
-0/16	-0/74	0/2	-0/748	Company size	
-1/211	-0/332	-0/657	-0/299	Financial leverage	
-0/248	1/451	1/911	1/482	Independent variable	
0/46	0/841	0/659	0/796	Width from origin	Regression coefficients Meaningful level
0/874	0/464	0/842	0/459	Company size	
0/233	0/742	0/515	0/766	Financial leverage	
0/805	0/155	0/063	0/146	Independent variable	

With variables Controlling	Without variables Controlling	Hypothesis
P= 0.009 confirmed	P= 0.008 confirmed	1- There is a meaningful relationship between ROE & Intellectual capital
P=0.003 confirmed	P=0.001 confirmed	2- There is a meaningful relation between ROE & physical capital.
P= 0.011 confirmed	P=00.01 confirmed	3- There is a meaningful relation between ROE & human capital.
P=0.039 confirmed	P= 0.052 rejected	4- There is a meaningful relation between ROE & structural capital.
P= 0.012 confirmed	P= 0.02 confirmed	5- There is a meaningful relation between ROA & intellectual capital.
P= 0.017 confirmed	P= 0.226 rejected	6- There is a meaningful relation between ROA & physical capital.
P=0.012=P confirmed	P= 0.023 confirmed	7- There is a meaningful relation between ROA & human capital.
P= 0.006 confirmed	P=0.01 confirmed	8- There is a meaningful relation between ROA & physical capital
P= 0.000 confirmed	P=0.001 confirmed	9- There is a meaningful relation between profit margin & intellectual capital.
P=0.000 confirmed	P=0.001 confirmed	10- There is a meaningful relation between profit margin & physical capital.
P=0.000 confirmed	P=0.001 confirmed	11- There is a meaningful relation between profit margin & human capital.
P=0.000 confirmed	P= 0.082 rejected	12- There is a meaningful relation between profit margin & structural capital.
(P= 0.29) rejected	P=0.08 rejected	13- There is a meaningful relation between net profit growth rate & intellectual capital.
P=0.168 rejected	P=0.031 confirmed	14- There is a meaningful relation between net profit growth rate & physical capital.
P=0.309 rejected	P=0.085 rejected	15- There is a meaningful relation between net profit growth rate & human capital.
P=0.664 rejected	P= 0.794 rejected	16- There is a meaningful relation between net profit growth rate & structural capital.

As it is observed in the above table, all models have a meaningful level more than 0.05, so with the impact of controlling variables there is not any meaningful relation between the variables of intellectual capital, physical capital, and human capital, structural capital with the profit margin, which its meaningful level is respectively, 0.309, 0.168, 0.298, and 0.664.

## VII. RESEARCH RESULTS SUMMARY

### a. Research restriction:

1- One of the research restrictions is the low number of banks active in the field of banking industry in Iran, which out of this number some companies with regard to the restrictions have been deleted.

2. One of other research restrictions is the sample banks reporting quality difference, which can affect on research.

### b. Suggestions:

Based on the results of the research the following proposals will be presented:

1- Studying the relation between the intellectual capital on the profitability ratios of the petroleum products industry according to the valuable role of this industry in the economy of the country.

2. Considering the restrictions and requirements of Iran accounting standards, it is suggested that the banks provide some information about how to identify, measuring and their intellectual capital reporting in the form of annual report of the Board of Directors to the Assembly.

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