INVESTIGATING THE EFFECT OF THE FINANCING STRUCTURE ON THE ORGANIZATION'S PRODUCTIVITY WITH A MODERATING ROLE OF INTELLECTUAL CAPITAL IN COMPANIES LISTED ON THE TEHRAN STOCK EXCHANGE

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Abstract

This research aims to investigate the effect of financing structure on the organization's productivity with an emphasis on the moderating role of intellectual capital in companies admitted to the Tehran Stock Exchange. The current research is a branch of experimental research and post-event type, which was conducted based on the real information of the stock market and the financial statements of the companies admitted to the stock exchange. The research is correlational. The current research statistical population includes all companies active in the Tehran Stock Exchange. The information related to 122 companies that have been analyzed in the period of 8 years from 2009 to 2016 to examine the relationship between the variables to test the research data. The Eviews software was used to analyze the statistical data. According to the results, short-term financing (short-term loans) does not significantly affect productivity based on total assets and fixed assets but there is a positive and significant relationship between long-term financing (long-term loans) and organization productivity (total assets and fixed assets). In addition, the capital level and capital increase do not have a significant effect on the organization's productivity (total assets and fixed assets). The results also showed that intellectual capital has a positive and significant effect on the relationship between short-term financing (short-term loans) and the organization's productivity based on fixed assets, while it does not affect overall productivity. In addition, intellectual capital positively and significantly influences the relationship between long-term financing (long-term loans) and the organization's productivity (total assets and fixed assets). Finally, intellectual capital does not significantly affect the relationship between the level of capital and the increase of capital with the productivity of the organization.

Keywords: Financing Structure, Organizational Productivity, Intellectual Capital, Tehran Stock Exchange

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Introduction

Productivity is one of the most important goals of organizations and institutions in today's world (Çakar, S., et. al., 2022; Nguyen, C. D. T., 2022). The productivity level guarantees the growth and survival of leading organizations and answers many production and economic problems in production units (Sadovnikova, N., et. al., 2022; Van Nguyen, T., et. al., 2022). Productivity is an index that can show the effectiveness of the institution correctly and is a suitable standard for comparing the performance of the institution with similar institutions or comparing and evaluating for a while (Van, T. P., 2022). The measurement of meaningful and decisive factors is the need to evaluate and compare productivity, which is called productivity indicators. Profit acquisition is the goal of the for-profit unit, therefore, poor performance indicates a lack of success in this case, which can lead to the suspension, bankruptcy, and liquidation of the for-profit unit if it is not corrected. On the other hand, the management should be well-considered in using the available resources and facilities, because it is an essential factor in the survival of the company in the field of competition (Leillipour, 2009).

The most important goal of leading organizations is productivity which is considered a philosophy and a perspective based on the strategy of improving operations. This strategy helps organizations guarantee their long-term profitability by promoting and growing productivity, sources, and production factors. Productivity is mentioned from different dimensions and its application and importance are evident. Nowadays, improving productivity is not a choice but a necessity due to the limited resources and the unlimited human needs, the increase in population, and the severe and cruel competition in the world economy. On the other hand, it is also important to provide the cost of financial resources to improve productivity. For two reasons, productivity must finance structures that explain the number of capital costs and the cost of financing from debt and capital for companies. First, the improvement of productivity can affect the amount and cost of providing credit from the place of debt. It means that an increase in productivity leads to an increase in the income and profitability of companies. As a result, the company's ability increases to repay the principal and sub-debts received, which is a factor that increases the borrowing capacity and reduces the risk of bankruptcy due to the increase in financial leverage. Finally, when it comes to granting loans or credits, creditors ask for a lower cost of debt than companies with a higher leverage risk.

Secondly, the increase in performance due to the improvement of productivity can adjust the expectations of shareholders and owners regarding the future and the company's profit. This effect changes the cost of equity by changing the expected return of investors. Therefore, management can predict the credit future of the company by determining the optimal financing structure which is one of the most important financial indicators. The management can also plan on how and how much investment opportunities are used to improve the productivity and final output of the organization.

The current research is also effective due to the growing trend of the influence of intellectual capital on various functional aspects of companies. Intellectual capital is one of the valuable capitals of companies, which creates value for the organization and helps them to achieve their high goals. In addition, intellectual capital is considered an integral part of improving processes in organizations, and the path of productivity management and its improvement must inevitably be influenced by value-creating intellectual capital. Therefore, this research studies the importance and necessity of productivity in company management, the necessity of correct management of how to finance and intellectual capital, and the effect of these factors on improving the productivity of organizations. In this study, the researcher investigates the impact of the financing structure on the productivity of the organization by considering the intellectual capital in the companies admitted to the Tehran Stock Exchange.

Financing structure

The optimal combination of debt and equity determines the capital structure and provides the financial resources needed by companies. In today's evolving conditions, if a company handles capital management (funding and consumption) in the best possible way can provide its main owners (shareholders) with more profit. This issue requires the financial managers to create the optimal combination of capital structure by considering the quantitative parameters in the

financial statements, especially profitability, liquidity, sales, operating profit, and future growth opportunities, and the qualitative variables governing the performance of companies, including the type of industry, general view and the combination of ownership (Fathi et al., 2014).

Companies take loans because of the value of tax savings due to interest expense. There will be a low probability of bankruptcy and financial crisis if the amount of debt is somewhat low, and the benefits of debt will be more than its cost. The possibility of a financial crisis becomes a chronic and permanent problem when the amount of debt is high. Therefore, the benefits of debt financing may be less than what is needed to offset the costs of the financial crisis. It seems that the optimal capital structure is somewhere between these two limits.

When the companies' capital structures are examined in the real world, a rule is created that most companies operating in similar industries have a similar capital structure. Based on this issue, the nature of the company's assets and operations is one of the most important factors determining its capital structure (Jahankhani and Shouri, 2009).

Several theories have been developed over the years to determine the optimal capital structure. Despite the theoretical research of capital structure, managers can not use any specific method to determine the optimal level of debt because theories related to the capital structure are different in the subject for example, balance theory emphasizes taxation and hierarchy theory on differences in information. Anyway, these theories guide in understanding the financing behavior of companies and identifying potential factors influencing the capital structure (Boyle and Pollock, 2012).

Organization productivity

Productivity means working smarter, not harder. Productivity is not specialized only to human power. Rather, it means using all resources effectively, including capital, land, materials, energy, time, information, and manpower. So productivity is called a multi-dimensional phenomenon. Productivity does not consider only the quantity of output. Increasing the prices can make a profit, and productivity may decrease. There is a difference between productivity and profitability. Reducing costs does not nessecrily increase productivity, especially some costs such as training, which increase productivity in the long term and may not have short-term effects. So the costs should be reduced based on the importance degree of each effective factor in productivity. Human resources and human resources management in organizations perform as catalysts and accelerators to increase productivity in the organization. Therefore, they should consider appropriate strategies to increase productivity. This issue is important because human beings cannot be compared with other organizational factors. For example, in a physical and industrial environment, effectiveness and efficiency are always smaller than one which is the result of the ratio of current capacity to official capacity. But, it can be greater than one for humans (open system) due to the correct motivation and leadership. Productivity is synonymous with the quality of human resources and concerns people with the skills of team spirit, efficiency, creativity, innovation, work pride, and customer orientation to the organization (Harrison, 1982).

Intellectual Capital

Intellectual capital is created in the field of science and knowledge. This word is still used in its development period. Many systems are using intellectual capital, but still many people who are working in organizations and economic enterprises are familiar with this concept (Zanjirdar et al., 2008).

The Economic Cooperation and Development Organization defines intellectual capital as the economic value of two categories of intangible assets in a company: 1- Organizational capital (structural), 2- Human capital that includes human resources within the organization (i.e. the personnel of the organization) and human resources outside the organization (i.e. customers and suppliers). The recent contemporary classifications have specifically divided intellectual capital into external capital (customers), internal capital (structural), and human capital (Bentis, 2000).

Bentis (1999), Ross et al. (1997), Brooking (1996), and Stewart (1997) are those who have reviewed the intellectual capital literature. Below are the important definitions of four prominent pointers. However, intellectual capital is a vague and complex term, it can provide a new resource base through which the organization can compete when it is understood and exploited (Bentis, 1996, pp. 41-47). In another definition, Bentis believes that intellectual capital is the effort to effectively

use knowledge (final product) versus information (raw material) (Bentis, 1998, p. 63). Intellectual capital is a term to combine the intangible assets of the market, intellectual assets, human assets, and infrastructure assets, which enable the organization to perform its activities (Brooking, 1996).

Intellectual capital and performance

Intellectual capital is the main factor in creating value in companies, and companies are moving towards creating value through the intellectual capital in the organization. Regarding the creation of company value, the former manager's view has changed by physical assets. The traditional accounting systems' main problems are their inadequacy and inability to measure and report information related to intangible assets and hidden values of the company (including knowledge).

It is paid attention to investigating missing values (lost) from financial statements due to the increasing difference observed between the market value and the book value in many companies. The limitations of financial statements explain the company's value because the source of the company's economic value is producing material goods, not creating intellectual capital. The research results show that intellectual capital is a hidden value, which distorts the financial statements and leads organizations to achieve competitive advantages. In addition, the limitations of financial statements make it difficult to accurately explain the company's performance. These days, it is revealed that sources of economic value are the product of intellectual capital, not material goods.

On the other hand, new researches address the role and importance of the contribution of intellectual capital in the managerial, technical, and social progress of the economy and organizational knowledge is the main factor of competitive advantage and value creation. Therefore, the ability to create, store, distribute, and use knowledge assets play a role in achieving a competitive advantage and surviving the organization. Intellectual capital is measured based on a strategic approach to intangible assets. These assets effect is measured based on the value creation level and its benefits to the organization (Nikomram and Eshaghi, 2011). Lu (2010) conducted research on American companies between 2006 and 2010. The result shows that the ratio of market value to book value of 500 American companies has increased from one to five times and the market value in financial reporting is not provided in 80% of the companies. The limitations of financial statements explain the value of the company because the source of economic value is not only producing material goods but also creating intellectual capital. Intellectual capital includes human capital and structural capital includes customers, databases, trademarks, and systems, which have an important role in value creation and competitive advantage for the company (Edwinson and Malone, 2015). Therefore, intellectual capital is an influencing factor in the company's financial performance. Intangible resources and intellectual capital such as human resources are used a lot in the banking industry, therefore, these resources can be an influencing factor on financial performance.

Research related to intellectual capital and performance

Ozkan et al. (2016) studied the relationship between intellectual capital performance and the financial performance of 44 banks operating in Turkey between 2005 and 2014. The intellectual capital performance of banks is measured through the coefficient of value-added intellectual capital (VAIC). The intellectual capital performance of the Turkish banking sector is generally affected by human capital efficiency (HCE). Development and investment banks have the highest average VAIC in terms of bank types. When VAIC is divided into its components, capital efficiency (CEE) and human capital efficiency (HCE) positively affect banks' financial performance. CEE has a greater impact on banks' financial performance than HCE. Therefore, banks active in the Turkish banking sector should use their financial and physical capital to have a higher profitability level.

Chang (2014) used the adjusted intellectual added value coefficient and investigated the impact of intellectual capital on market value (the ratio of market value to book value) and profitability (return on assets, return on equity, simple profitability, and profit margin) in the information technology industry of Taiwan during the years 2009-2013. According to the results, there is a positive and significant relationship between intellectual capital and each of its subcategories with market value and company financial performance.

Clark et al. (2014) investigated the impact of

intellectual capital on the performance of companies listed on the Australian Stock Exchange. The results indicate a positive and significant effect of capital on the performance of the company. In addition, the intellectual capital in the previous period positively and significantly affects the performance of the company in the current period. Finally, human and structural capital efficiency moderates the relationship between capital efficiency and company performance.

Zagal and Malwal (2012) investigated the role of added value as an indicator of intellectual capital and its effect on economic, financial, and stock market performance. Their study was mainly about the conceptual relationship between intellectual capital and added value. They believed that investing in intellectual capital increases the companies' ability to produce and provide value-added products and services. They also define intellectual capital as the main and most important source of creating company value.

Chang and Hsieh (2011) investigated the relationship between the components of intellectual capital and three operational, financial, and market functions in the Taban Stock Exchange in the electronic industry. They used a modified intellectual added value coefficient model to measure intellectual capital. According to the research results, operational performance has a positive relationship with the used capital and has no relationship with the structural and human capital. Intellectual capital components have also a negative relationship with the market and financial performance.

Chang and Hsieh (2011) investigated the relationship between intellectual capital components and three operational, financial, and stock market performances in Taiwan. They used an adjusted intellectual added value coefficient model to measure intellectual capital. Based on the results, there is no relationship between operational performance and capital employed and structural and human capital. In addition, intellectual capital components have a negative relationship with the market and financial performance. Research and development expenses have a positive relationship with three functions, but intellectual assets only have a positive relationship with operational performance.

Maditiens et al. (2011) investigated the relationship between the components of intellectual capital with financial performance and the Greek stock market. They used the intellectual added currency coefficient method to calculate intellectual capital. The research results show no significant relationship between intellectual capital and financial performance and the stock market. Only the relationship between human capital and return on equity has been confirmed.

Qaraei Ahangar (2011) investigated the relationship between intellectual capital and financial performance, which includes profitability, employee productivity, and sales growth. The results showed that the performance of intellectual capital can explain profitability and efficiency.

Zeghal & Maaloul (2010) measured intellectual capital with a value-added index and investigated its results on the financial, economic, and market value performance of 300 English companies. The intellectual added value model has been used to measure intellectual capital. The results showed that the efficiency of intellectual capital has a positive and significant relationship with economic performance and financial performance, but in market value performance, the relationship is only significant in the technology industry. In addition, intellectual capital has a positive and meaningful relationship with economic performance and financial performance, but in market value performance, it is only significant in the technology industry. Capital employed also has a negative relationship with economic performance, but has a positive and significant relationship with market value performance and financial performance.

Jamshidi et al. (2017) examined the relationship between intellectual capital and the performance of participation in companies listed on the Tehran Stock Exchange. The results show a positive and significant relationship between the components of intellectual capital and the company performance based on the return on assets and Tobin's Q index.

Moradpour and Sorkhe Miri (2017) studied the impact of corporate governance on the structure of intellectual capital and financial performance in companies listed on the Tehran Stock Exchange. The results showed that the CEO as a chairman or vice president, the quality of audit, and unnecessary members had a significant impact on the structure of intellectual capital and financial performance. The results of the fourth

sub -hypothesis test also showed that institutional shareholders do not affect the structure of intellectual capital and financial performance. This study's results helped all stakeholders identify the factors affecting the structure of intellectual capital and financial performance in the company.

Heidarian (2017) studied the effect of intellectual capital efficiency on cash flow and financial performance in companies listed on the Tehran Stock Exchange from the years 2007 to 2011. According to the results, intellectual capital has a positive and significant relationship at 99 % reliability. In addition, there is a positive relationship between cash flow and financial leverage and company size and a negative relationship between cash flows and company growth. These relationships are not statistically significant, and intellectual capital has a negative relationship with two components of ROS and ROA, and a positive relationship with another ROE, but these relationships are not statistically significant.

Hassanzadeh and Hussein's brothers (2016) examined the impact of intellectual capital on the financial performance of Isfahan Saderat Bank. The value-added method of intellectual capital presented by Palic in 2000 was used to investigate intellectual capital. The value-added coefficient of intellectual capital measures three types of data: the efficiency of capital used, human capital, and structural capital. This study analytically tests the separate effects of capital efficiency, including human capital efficiency, structural capital efficiency, and capital efficiency on the financial performance of Isfahan Saderat Bank Branches using the regression method between 2009-2013. There is a significant relationship between intellectual capital and the performance indicators and intellectual capital has an impact on these indicators.

Zarei et al (2016) studied that the value of intellectual capital is one of the factors that influence the profitability and competitive advantage of companies and banks in the current knowledge-based world which is not offered in financial statements. This study mainly empirically examines the impact of the capital value and its components on the financial performance of banks accepted in the Tehran Stock Exchange. Based on the results, the financial performance of banks listed on the stock market can be significantly strengthened by increasing the efficiency of structural and human capital There is also a positive and significant relationship between the first interruption of physical capital and ROA, ROE, and ATO, but this index has no significant relationship with (MB). Finally, the test results show that the intellectual capital efficiency coefficient has a positive and significant impact on the financial performance of banks listed on the Tehran Stock Exchange.

Research Methodology

The current research is experimental and post-event research, which was based on the real information of the stock market and the financial statements of the companies admitted to the stock exchange. The research is correlational.

Research models

The models used are as follows:

First model:

$$GEP_{it} = \beta + \beta_1 \mathrm{SHORT}_{it} + \beta_2 \mathrm{LONG}_{it} + \beta_3 \mathrm{CAPITAL}_{it} + \beta_4 \mathrm{INCR}_{it} + \beta_5 \mathrm{INTL}_{it} + \beta_6 \mathrm{SHORT} * \mathrm{INTEL}_{it} + \beta_7 \mathrm{LONG} * \mathrm{INTEL}_{it} + \beta_8 \mathrm{CAPITAL} * \mathrm{INTEL}_{it} + \beta_9 \mathrm{INCR} * \mathrm{INTEL}_{it} + \beta_{10} \mathrm{SIZE}_{it} + \beta_{11} \mathrm{LEV}_{it} + \beta_{12} \mathrm{M/B}_{it} + \beta_{13} \mathrm{CFO}_{it} + \beta_{14} \mathrm{Size}_{it} + \beta_{15} ROA_{it} + \varepsilon$$

Second model:

$$GFAP_{it} = \beta + \beta_1 \mathrm{SHORT}_{it} + \beta_2 \mathrm{LONG}_{it} + \beta_3 \mathrm{CAPITAL}_{it} + \beta_4 \mathrm{INCR}_{it} + \beta_5 \mathrm{INTL}_{it} + \beta_6 \mathrm{SHORT} * \mathrm{INTEL}_{it} + \beta_7 \mathrm{LONG} * \mathrm{INTEL}_{it} + \beta_8 \mathrm{CAPITAL} * \mathrm{INTEL}_{it} + \beta_9 \mathrm{INCR} * \mathrm{INTEL}_{it} + \beta_{10} \mathrm{SIZE}_{it} + \beta_{11} \mathrm{LEV}_{it} + \beta_{12} \mathrm{M/B}_{it} + \beta_{13} \mathrm{CFO}_{it} + \beta_{14} \mathrm{Size}_{it} + \beta_{15} ROA_{it} + \varepsilon$$

Research variables

Intellectual capital (INTL): VAICi value-added intellectual coefficient model of capital is used in the current research to evaluate intellectual capital in which the intellectual capital is the sum of the efficiency coefficient of structural capital, the efficiency coefficient of human capital, and the efficiency coefficient of communication capital, which is measured as follows:

VAICi= CEEi + HCEi + SCEi

Where: VAICi refers to the value-added intellectual coefficient of the company i, CEEi refers to the coefficient efficiency of the company's communication capital, HCEi refers to the human capital efficiency coefficient of the company i, and SCEi refers to the structural capital efficiency coefficient of the company i. The total value added (VAi) created by the banks should be calculated to calculate these variables. The total VAi is calculated as follows:

VAi = OPi + ECi + Ai

where: VAi refers to the total value added created by the company I, OPi refers to the operating profit of company I, ECi refers to the general and administrative expenses of the company and Ai refers to the depreciation of tangible and intangible assets of the company i. The coefficient of the added value of capital used is obtained as follows:

CEEi = VAi/CEi

where: CEi refers to the capital employed (book value of assets) of bank i. The coefficient of the added value of structural capital is obtained as follows:

SCi = VAi – HCi

SCEi = SCi/VAi

where: SC is structural capital and HC is human costs. The added value coefficient of human capital is obtained as follows:

HCEi = VAi/HCi

The operational definition of other research variables is in the following table:

Table 1: operational definition of research variables

Variable name	Variable type	symbol	variable defining
Productivity in terms of total assets		GEP	It is the dividing the total sales revenue by total assets
Productivity in terms of fixed assets		GFAP	It is the dividing the total sales revenue by total tangible fixed assets
Short term loans	Independent	SHORT	It is the ratio of total short-term loans and the current share of long-term debts on total assets
Long term loans	Independent	LONG	It is the ratio of total long-term loans to total assets
Capital level	Independent	CAPITAL	It is the ratio of equity to total assets
Capital Increase	Independent	INCR	Virtual variable: If the company has increased its capital in the current year, the number one is assigned, otherwise, the number zero is assigned.
Size	Controlling	Size	It is the natural logarithm of total assets
Financial leverage	Controlling	LEV	It is the ratio of total debt to total assets
Market value to book value	Controlling	M/B	It is dividing the market value of the company at the end of the financial year by the total book value
cash flow	Controlling	CFO	It is the cash flow resulting from operational activities
profitability	Controlling	ROA	It is the company's return on assets, which is obtained by dividing net profit by total assets

The current research statistical population includes all companies active in the Tehran Stock Exchange. This research does not use statistical sampling and the selecting companies'

method to test the research hypotheses is systematic elimination or filtering according to the following: Their financial statements items should be available as reported by the company for 2009 to 2017. The shares of the mentioned companies should have been continuously traded in the Tehran Stock Exchange from 2009 to 2017. There should be no change in activity or financial year during the research period. It should not be part of the investment, financial intermediation, holding, bank, and leasing companies. Companies should not have a trading break of more than three months in the sale of shares. The number of sample companies in the research is as follows according to the cases of systematic exclusion.

Table 2: Statistical sample of the research

Number	Description
348	The total number of companies admitted to the stock market until the beginning of 2016 is deducted:
109	The number of companies removed from the beginning of 2017 until now
8	The number of companies that are part of the investment, financial intermediation, banking, and leasing industries.
3	The number of companies that have changed financial year
65	The number of companies that have a trading break of more than three months.
41	The number of companies that do not have a financial year ending on 12/29.
122	The number of statistical samples

The Hausman test statistic was used to analyze the data. Then, the normality test of the data was performed. Finally, it has been examined through the results of econometric and regression models, and their confirmation or rejection has been done by analyzing them.

Findings

The information related to 122 companies sampled in the 8 years from 88 to 95 is analyzed to examine the relationship between the variables to test the research data. The Eviews software was used to analyze the statistical data.

Table 3: Pearson correlation coefficient matrix

Correlation coefficient	SHORT	LONG	CAPITAL	INCR	SIZE	LEV	MB	CFO	ROA	INTL-VAIC
SHORT	---									
LONG	6.8 %	---								
CAPITAL	-20.1 %	-15.5 %	---							
INCR	-10.2 %	-1.7 %	18.2 %	---						
SIZE	3.3 %	1.3 %	18.4 %	16.3 %	---					

LEV	49.4 %	19.8 %	-26.2 %	-10.1 %	-2.3 %	---				
MB	-8.8 %	-16.1 %	30.9 %	10.8 %	1.9 %	5.7 %	---			
CFO	-15.1 %	-5.8 %	41.8 %	2.8 %	13.7 %	-13.7 %	14.1 %	---		
ROA	-44.1 %	-24.0 %	76.9 %	15.4 %	17.0 %	-39.3 %	28.7 %	40.2 %	---	
INTL-VAIC	-10.0 %	-5.3 %	67.2 %	13.7 %	19.9 %	-10.9 %	32.5 %	31.1 %	54.9 %	---

The results of the correlation test related to the relationship between intellectual capital and productivity based on total assets and fixed assets are 9.7 and 2.9 percent, respectively.

Table 4: Stationarity test of variables

Variable name	Dickey-Fuller test statistic	P-Value	Conclusion
GEP	375.144	0.0000*	Stationary
Ln GFAP	267.415	0.0483*	Stationary
SHORT	316.390	0.0001*	Stationary
LONG	287.378	0.0000*	Stationary
CAPITAL	347.185	0.0000*	Stationary
INCR	107.588	0.0476*	Stationary
SIZE	351.894	0.0000*	Stationary
LEV	337.637	0.0001*	Stationary
MB	287.378	0.0000*	Stationary
CFO	337.830	0.0001*	Stationary
ROA	295.113	0.0139*	Stationary
INTL-VAIC	359.540	0.0000*	Stationary

Significant at the 95% level

The P-value of the Dickey-Fuller (ADF) statistic is less than 5%. Therefore, the null hypothesis based on the non-existence of a single root and in other words non- stationarity of all variables is rejected and they are Stationary.

Model recognition test

Chow's statistic is used to test the above hypothesis. The test results are summarized in the table below. The panel method is used for the estimation of the P-Value is less than 5%. Table (5) shows the results of the model recognition test.

Table 5 Model **recognition** test (Fixed effects test)

Model number	Limmer's F-statistics (Chow)	P-Value	Conclusion	The model used
3	0.437688	0.8787	The widths of the origins are	Pooled

			equal	
4	1.530320	0.1532	The widths of the origins are equal	Pooled

As observed, the P-values are more than 5% in both models. The null hypothesis based on the equality of the origins has not been rejected and the pooled method should be used to test the hypotheses. Therefore, there is no need for the Hausman test because both models are the Pold type.

Table 6: Summary of the results of data analysis

Model	$GEP_{it} = \beta + \beta_1 Short_{it} + \beta_2 Long_{it} + \beta_3 Capital_{it} + \beta_4 INCR_{it} + \beta_5 INTL_{it} + \beta_6 Short * INTEL_{it} + \beta_7 Long * INTEL_{it} + \beta_8 Capital * INTEL_{it} + \beta_9 INCR * INTEL_{it} + \beta_{10} Size_{it} + \beta_{11} LEV_{it} + \beta_{12} M/B_{it} + \beta_{13} CFO_{it} + \beta_{14} Size_{it} + \beta_{15} ROA_{it} + \varepsilon$			
Explanatory variables	The variable coefficient in the model	t statistic values	P-Value values	conclusion
Constant	0.509257	4.383284	0.0000*	Significant in the model at the 95% level
Short	0.047891	0.464987	0.6420	Non-significance in the model
Long	-0.384043	-5.294236	0.0000*	Significant in the model at the 95% level
Capital	0.123062	0.726281	0.4678	Non-significance in the model
INCR	0.052777	1.076519	0.2820	Non-significance in the model
INTL	-0.018009	-1.620498	0.1055	Non-significance in the model
Short * INTEL	0.048339	1.838794	0.0663	Non-significance in the model
Long * INTEL	-0.105870	-2.057862	0.0399*	Significant in the model at the 95% level
Capital * INTEL	0.020345	0.647422	0.5175	Non-significance in the model
INCR * INTEL	-0.007639	-0.619140	0.5360	Non-significance in the model
LEV	0.490014	7.923771	0.0000*	Significant in the model at the 95% level
M/B	0.001189	0.144978	0.8848	Non-significance in the model
CFO	0.511072	5.101616	0.0000*	Significant in the model at the 95% level
Size	-0.016247	-2.067676	0.0389*	Significant in the model at the 95% level
ROA	0.626871	4.137938	0.0000*	Significant in the model at the 95% level
F test values		19.36382	Durbin Watson test	1.789250
P-Value values		0.000000*	The values of the determination coefficient R2	0.155287
Jarque statistic values for model residuals (error)		2.665440	Values of adjusted determination coefficient R2	0.147267

P-Value values of model residuals (error)	0.322156*		
Model adequacy result:	The model is significant according to the values of F test and P-value which is less than 5%		

According to the model, the probability value (P-Value) of F is equal to 0.00 because these values are less than 0.05. It means that there is a meaningful model and there is a linear relationship between independent and dependent variables.

According to the regression test results, the coefficient of the Short*INTEL variable is positive in the model. In other words, when the variable of the intellectual capital increase, the relationship between the short-term financing variable and the organization's productivity variable in terms of total assets is direct and vice versa. This relationship is weak and it is not statistically significant at the 95% confidence level, because the obtained t value was lower than its corresponding value in the table (αt=0.975=1.96). In addition, the calculated p-value is more than 5% in this variable. Therefore, it is rejected that intellectual capital has a significant relationship between short-term financing and the organization's productivity in terms of total assets at the 95% confidence level.

According to the regression results test, the coefficient of the Long*Intel variable is negative in the model. In other words, when the intellectual capital variable increase, the relationship between the long-term financing variable and the organization's productivity variable in terms of total assets is inverse and vice versa. This relationship is statistically significant at the confidence level of 95% because the obtained t-value is more than its corresponding value in the table (αt=0.975=1.96) and also the calculated p-value is less than 5% in this variable. Therefore, it is confirmed that there is a significant relationship between intellectual capital and the relationship between long-term financing and the organization's productivity in terms of total assets at the 95% confidence level.

According to the regression test results, the coefficient of the Capital*Intel variable is positive in the model. In other words, when the intellectual capital variable increase, the relationship between the capital level variable and the organization's productivity variable in terms of total assets is direct and vice versa. This relationship is weak and it is not statistically significant at the 95% confidence level because the obtained t-value is lower than its corresponding value in the table (αt=0.975=1.96) and also calculated p-value is more than 5% in this variable. Therefore, it is rejected that there is a significant relationship between intellectual capital and the relationship between the level of capital and the organization's productivity in terms of total assets rejected at the 95% confidence level.

According to the regression test results, the coefficient of the Incr*Intel variable is negative in the model. In other words, when the intellectual capital variable increase, the relationship between the capital increase variable and the organization's productivity variable in terms of total assets is inverse and vice versa. This relationship is weak and it is not statistically significant at the 95% confidence level, because the obtained t-value is lower than its corresponding value in the table (αt=0.975=1.96) and also the calculated p-value is more than 5% in this variable. Therefore, it is rejected that intellectual capital has a significant relationship between capital increase and organizational productivity in terms of total assets at the 95% confidence level.

The coefficient of determination in the model is approximately 16.50%. Based on this coefficient, the independent variables in this model can justify more than 16% of the changes in the organization's productivity variable in terms of total assets. The value of the Durbin-Watson statistic in the above model is equal to 1.80, and values close to 2 indicate the absence of autocorrelation between the residuals of the model. The hypothesis of normality of the error values is accepted due to the values of Jarque Bera's statistic and the corresponding p-value which is more than 5%.

Table 7: The results summary

Model	$GFAP_{it} = \beta + \beta_1 \text{Short}_{it} + \beta_2 \text{Long}_{it} + \beta_3 \text{Capital}_{it} + \beta_4 \text{INCR}_{it} + \beta_5 \text{INTL}_{it} + \beta_6 \text{Short} * \text{INTEL}_{it} + \beta_7 \text{Long} * \text{INTEL}_{it} + \beta_8 \text{Capital} * \text{INTEL}_{it} + \beta_9 \text{INCR} * \text{INTEL}_{it} + \beta_{10} \text{Size}_{it} + \beta_{11} \text{LEV}_{it} + \beta_{12} \text{M/B}_{it} + \beta_{13} \text{CFO}_{it} + \beta_{14} \text{Size}_{it} + \beta_{15} ROA_{it} + \varepsilon$			
Explanatory variables	The variable coefficient in the model	t statistic values	P-Value values	conclusion
Constant	1.732484	4.935514	0.0000*	Significant in the model at the 95% level
Short	0.377613	1.173912	0.2407	Non-significance in the model
Long	-0.140247	-7.344461	0.0000*	Significant in the model at the 95% level
Capital	-0.235755	-0.462301	0.6440	Non-significance in the model
INCR	0.085908	0.575528	0.5651	Non-significance in the model
INTL	-0.050741	-1.442229	0.1496	Non-significance in the model
Short ∗ INTEL	0.207497	2.508580	0.0123*	Significant in the model at the 95% level
Long ∗ INTEL	-0.695722	-4.108639	0.0000*	Significant in the model at the 95% level
Capital ∗ INTEL	-0.020241	-0.213552	0.8309	Non-significance in the model
INCR ∗ INTEL	-0.018443	-0.492275	0.6226	Non-significance in the model
LEV	0.823653	4.356235	0.0000*	Significant in the model at the 95% level
M/B	0.000831	0.033338	0.9734	Non-significance in the model
CFO	-0.405343	-1.353139	0.1763	Significant in the model at the 95% level
Size	-0.055587	-2.362237	0.0184*	Significant in the model at the 95% level
ROA	2.710148	5.937056	0.0000*	Significant in the model at the 95% level
F test values		9.025108	Durbin Watson test	1.957565
P-Value values		0.000000*	The values of the determination coefficient R2	0.119838
Jarque statistic values for model residuals (error)		0.974639	Values of adjusted determination coefficient R2	0.106560
P-Value values of model residuals (error)		0.614271*		
Model adequacy result:	The model is significant according to the values of F test and P-value which is less than 5%			

Table (7) in the model indicates that the probability value (or P-Value) of F is equal to 0.00 because these values are less than 0.05. It means that there is a significant model and there is a linear relationship between independent and dependent variables.

According to the regression test results, the Short*INTEL variable coefficient is positive in the model In other words, when the variable of the intellectual capital increase, the relationship between the variable of short-term financing and the variable of productivity of the organization in terms of fixed assets is direct and vice versa. This relationship is statistically significant at the confidence level of 95% because the obtained t-value is more than its corresponding value in the table (αt=0.975=1.96) and also the calculated p-value is less than 5% in this variable. Therefore, it is confirmed that there is a significant relationship between intellectual capital on the relationship between short-term financing, and the organization's productivity in terms of fixed assets at the 95% confidence level.

According to the regression test results, the Long*INTEL variable coefficient is negative in the model In other words, when the intellectual capital variable increase, the relationship between the long-term financing variable and the organization's productivity variable in terms of fixed assets is inverse, and vice versa. This relationship is statistically significant at the confidence level of 95% because the obtained t-value is more than its corresponding value in the table (αt=0.975=1.96) and also the calculated p-value is less than 5% in this variable. Therefore, it is confirmed that there is a significant relationship between intellectual capital on the relationship between long-term financing, and the organization's productivity in terms of fixed assets at the 95% confidence level.

According to the regression test results, the coefficient of the Capital*INTEL variable is negative in the model. In other words, when the intellectual capital variable increase, the relationship between the capital level variable and the organization's productivity variable in terms of fixed assets is inverse and vice versa. This relationship is weak and it is not statistically significant at the 95% confidence level because the obtained t-value is lower than its corresponding value in the table (αt=0.975=1.96) and also calculated p-value is more than 5% in this variable. Therefore, it is rejected that there is a significant relationship between intellectual capital and the organization's productivity in terms of fixed assets at the 95% confidence level.

According to the regression test results, the coefficient of the Incr*INTEL variable is negative in the model. In other words, when the intellectual capital variable increase, the relationship between the capital increase variable and the organization's productivity variable in terms of fixed assets is inverse and vice versa. This relationship is weak and it is not statistically significant at the 95% confidence level because the obtained t-value is lower than its corresponding value in the table (αt=0.975=1.96) and also the calculated p-value is more than 5% in this variable. Therefore, it is rejected that intellectual capital has a significant relationship between capital increase and organizational productivity in terms of fixed assets at the 95% confidence level.

The coefficient of determination in the model is approximately 11.98%. This coefficient indicates that the independent variables in this model can justify more than 11% of the changes in the organization's productivity variable in terms of fixed assets. The value of the Durbin-Watson statistic in the above model is equal to 1.95, and values close to 2 indicate the absence of autocorrelation between the residuals of the model. The hypothesis of the normality of the error values is accepted according to the values of Jarque Bera's statistic and the corresponding P value which is more than 5%.

Conclusion

This research investigates the effect of financing structure on organizational productivity with an emphasis on the moderating role of intellectual capital in companies admitted to the Tehran Stock Exchange. Two indicators of productivity based on total assets and fixed assets have been used to evaluate the productivity of the organization. Therefore, two models are used in the analysis. The whole model analysis results show that the P-VALUE in both models is less than 5%, which shows a significant relationship between the independent variables and the dependent variable. In both models, the coefficient of determination is 15.6 and 11.9%, respectively. It shows that the independent variables in the model have 15.6 and 11.9% power to explain the dependent variable, i.e. productivity based on total assets and fixed assets. The variable coefficient used for hypothesis analysis is β_6 in both models. The significance of the above coefficient in both models indicates the significance of the independent variable and the impact of short-term financing (short-term loans) on the organization's productivity regarding intellectual capital. The above variable coefficient direction also shows

how short-term financing (short-term loans) affects the organization's productivity influenced by intellectual capital. According to the results, the P-VALUE of the above coefficient is more than 5% in the first model.

Therefore, the results show that intellectual capital does not affect the relationship between short-term financing (short-term loans) and the productivity of the company's total assets.

In the second model, the above P-VALUE coefficient is less than 5%, and intellectual capital affects the relationship between short-term financing (short-term loans) and productivity based on the fixed assets of companies. The above coefficient is positive in the model. Therefore, the increase in short-term financing under the influence of the increase in intellectual capital increases productivity based on fixed assets. Intellectual capital has been effective in the relationship between short-term financing and productivity indicators.

The results show that short-term financing under the influence of intellectual capital can improve productivity based on the fixed assets of companies. This issue shows the intellectual capital importance and human resources' ability to manage short-term resources. Intellectual capital can properly manage short-term loans that positively affect the organization's productivity. The resources attracted from short-term loans through efficient intellectual capital are spent on highly profitable investments and create a positive net present value in the company. This factor improves the productivity level based on fixed assets by increasing revenues and reducing costs.

Two indicators of productivity based on total assets and fixed assets have been used to investigate the impact of intellectual capital on the relationship between long-term financing (long-term loans) and the organization's productivity. Therefore, two models are used in the analysis of the present hypothesis. Based on the results of the whole model analysis, the P-VALUE in both models was less than 5%. Therefore, there is a significant relationship between the independent variables and the dependent variable. In both models, the coefficient of determination is 15.6 and 11.9%, respectively. It shows that the independent variables in the model have 15.6 and 11.9% power to explain the dependent variable, i.e. productivity based on total assets and fixed assets. The variable coefficient used to analyze the hypothesis is β_7 in both models. The above coefficient in both models shows the significance of the independent variable and the impact of long-term financing (long-term loans) on the organization's productivity regarding intellectual capital. The above variable coefficient direction also shows how long-term financing (long-term loans) affects the organization's productivity under the influence of intellectual capital. According to the results, the above P-VALUE coefficient in both models is less than 5%, which shows that intellectual capital affects the relationship between long-term financing (long-term loans) and company productivity. The above coefficient is positive in both models. Therefore, an increase in long-term financing under the influence of an increase in intellectual capital increases the organization's productivity.

The results also show that long-term financing under the influence of intellectual capital can improves the company's productivity. This issue shows the intellectual capital importance and human resources' ability to manage long-term acquired resources. Intellectual capital can properly manage long-term loans that positively affect the organization's productivity. The resources attracted from long-term loans through efficient intellectual capital are spent on highly profitable investments and create a positive net present value in the company. This factor ultimately improves the organization's productivity level by increasing the company's revenues and reducing its costs.

Does intellectual capital affect the relationship between the capital level and the organization's productivity? Two indicators of productivity based on total assets and fixed assets have been used to evaluate the organization's productivity. Therefore, two models are used in the analysis of the present results. According to the results of the whole model analysis, the P-value in both models is less than 5%. Therefore, there is a significant relationship between the independent variables and the dependent variable. In both models, the coefficient of determination is 15.6 and 11.9%, respectively. It shows that the independent variables in the model have 15.6 and 11.9% power to explain the dependent variable, i.e. productivity based on total assets and fixed assets. Based on the results, the above P-VALUE coefficient is more than 5% in both models which shows that intellectual capital does not affect the relationship between the capital level and companies' productivity.

The results also show that the capital level under the influence of intellectual capital does not affect productivity. This is an expected issue because the method of using the absorbed funds and using the resources obtained from the companies' funds will not necessarily improve the process of input and output. In addition, intellectual capital can not change the direction of using the above-mentioned absorbed resources. The capital level increase in the companies may be due to company development and legal reasons. The main reasons that increase the companies' capital level ultimately do not improve productivity.

The researcher seeks another model of intellectual capital that affects the relationship between capital increase and organizational productivity. Two indicators of productivity based on total assets and fixed assets have been used to evaluate the organization's productivity. Therefore, two models are used in the hypothesis analysis. According to the results, the whole model analysis shows that the P-VALUE in both models is less than 5%. Therefore, there is a significant relationship between the independent variables and the dependent variable. In both models, the coefficient of determination is 15.6 and 11.9%, respectively. It shows that the independent variables in the model have 15.6 and 11.9% power to explain the dependent variable, i.e. productivity based on total assets and fixed assets. Based on the results, intellectual capital does not affect the relationship between capital increase and company productivity.

The results also show that the capital increase under the influence of intellectual capital does not affect the company's productivity. This issue reason can be found in the capital increase in companies. The main reason for increasing capital of companies cannot increase productivity. Efficient intellectual capital even cannot change this trend. The major part of this capital increase was from the accumulated profit or asset revaluation, which does not bring any new resources to increase the organization's productivity. Intellectual capital is also responsible for guiding the company based on previous sources. The capital increase is mainly due to the organization's development and the expansion of the company's activities, which is considered a long-term investment and does not improve the organization's productivity in the short term. The effectiveness of intellectual capital in improving productivity should be sought in long-term periods.

It is suggested to include the financing structure and short-term financing under the influence of intellectual capital in decision models as an effective factor on productivity to evaluate the organization's productivity (based on total assets and fixed assets).

It is also suggested to include the financing structure and long-term financing under the influence of intellectual capital as a factor affecting productivity in decision models to evaluate the organization's productivity (based on total assets and fixed assets) because the results show that long-term loans under the influence of intellectual capital increase the productivity. It is suggested not to include the capital level under the influence of intellectual capital as an effective factor on productivity in decision models to evaluate the organization's productivity (based on total assets and fixed assets). It is also suggested not to include capital increase under the influence of intellectual capital as an effective factor on productivity in decision models to evaluate the organization's productivity (based on total assets and fixed assets) because the results show that the increase in capital under the influence of intellectual capital does not affect the productivity.

The present study used the coefficient model of the added value of intellectual capital to evaluate intellectual capital. Therefore, the effects of using other methods and models to evaluate intellectual capital may results contrary to the present study results.

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