



## INVESTIGATING THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE OF COMPANIES LISTED ON THE IRAQ STOCK EXCHANGE

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<p><b>Received:</b> 1<sup>st</sup> February 2022  <b>Accepted:</b> 1<sup>st</sup> March 2022  <b>Published:</b> 11<sup>th</sup> April 2022</p>	<p>The purpose of this study was to look into the relationship between intellectual capital and the performance of companies listed on the Iraq Stock Exchange. The current study is a descriptive-correlational descriptive - correlational descriptive - correlational descriptive - correlational descriptive - correlation In other words, the purpose of this research is to determine whether or not there is a significant relationship between the components of intellectual capital and the performance of companies listed on the Iraq Stock Exchange. Hypotheses were tested for this purpose using a regression model. During the seven-year research period from 2012 to 2018, the research hypotheses were tested on a sample of 33 companies listed on the Iraq Stock Exchange. There is no significant difference, according to the findings of this study.</p>

**Keywords:** Iraq Stock Exchange, intellectual capital,

### INTRODUCTION

In the high-competitive era of organizations, we face an environment characterized by increasing complexity, dynamism, and globalization, so organizations face new challenges for their establishment and survival, which necessitates a greater focus on internal capabilities and skill development and strengthening. It is realized through the foundations and fundamentals of intellectual capital and organizational knowledge, which organizations use to achieve better business performance. Knowledge, rather than physical and financial capital, natural resources, or labor force, is now the most important economic resource (Seetharaman et al., 2004). Along with land, labor, and financial capital, intellectual capital, as the fourth factor of production, optimizes the incentives to create intangible value (Chan, 2009). Thus, in today's knowledge-based world, organizational capabilities are based on knowledge.

John Kenneth Galbraith coined the phrase "intellectual capital" in 1969. He believed that intellectual capital encompassed more than just thinking and included some level of intellectual action. According to this definition, intellectual capital is not only a static intangible asset in and of itself, but also an ideological process and a means to an end. When intellectual

capital is effectively formulated and applied, it can generate value by generating a type of asset known as "intellectual capital." There are several definitions of intellectual capital. Stewart (1997), for example, classifies it as intellectual materials, knowledge, information, intellectual property, and experience. Edvinsson and Malone (1997) define intellectual capital as "knowledge that can be converted into value" (Asadi and Yokhneh, 2014). Identifying the various components of intellectual capital leads to improved performance. Intellectual capital is one of the factors. Because no research has been conducted on the impact of intellectual capital on the financial performance of listed companies in Iraq, the current study was designed to investigate the impact of intellectual capital on the organizational financial performance of listed companies by answering the general question of whether there is a significant relationship between intellectual capital and the performance of listed companies on the Iraq Stock Exchange. In other words, it draws individuals and organizations' attention to these valuable assets. If used correctly in conjunction with physical and financial assets, it will provide companies with a long-term competitive advantage and superior financial performance. Table 1- Fundamental background of performance evaluation

1960s	1970s	1980s	1990s
Dupont system	Earnings per share	Ratio of market	Economic value



	EPS	value to book value	added (EVA)
rate of return of investments	Combination of price and salary of capital owners	Rate of return on earnings	Market value added (MVA)
Additional rate of return		Net rate of return of assets	Balanced scorecard (BSC)
		Cash flows	Shareholders' right
			Cash return on investments

### Theoretical foundations and research background

Intellectual capital is the difference between a company's market value and the cost of replacing its assets. In other words, intellectual capital includes all processes and assets that are not reflected in the balance sheet but have an impact on organizational performance and value. Intellectual capital is knowledge and information that can be used to create value for a company. Intellectual capital refers to a company's assets that add value but are not tangible or visible (Gholami, 2015). In another definition, intellectual capital is defined as the sum of an organization's members' knowledge and their application of that knowledge. Intangible assets are known as business goodwill, and intellectual capital is a component of this goodwill (Mashayekh et al., 2011). Many studies have been conducted to investigate the effect of intellectual capital on financial variables. Traditionally, one of the performance aspects of organizations that has received a lot of attention is their financial aspect. Because profit is often regarded as the primary goal of many businesses, financial performance and its measurement are critical. There are several ways to evaluate performance, but evaluating the financial dimension of the companies is more important. Methods for evaluating financial performance can be classified into four types:

- 1- The methods in which accounting information is used to evaluate performance, such as financial ratios of ROA and ROE
- 2-Methods that use a combination of accounting and market information to evaluate performance, such as different versions of the Q-Tobin or E / P ratio
- 3-Ratios used using financial management data such as earnings per share and additional earnings per share
- 4- Ratios that, despite the use of accounting information, are economic criteria such as EVA and

MVA and REVA (Malekian and Asghari, 2006; Asadi and Kiani Nejad, 2014).

Dastgir et al. (2014) examined the impact of intellectual capital on financial performance. The results of testing their research hypotheses show a significant relationship between intellectual capital and two indicators of financial performance (price-to-earnings ratio and growth rate).

Also, Salehi et al. (2013) stated that some components of intellectual capital such as relational capital can be considered as an effective factor in improving the level of financial performance of the company. As a result, it is possible to conclude that intellectual capital can be an effective factor in a company's financial performance. Tan et al. (2007) examined the relationship between intellectual capital and its components and the financial performance of companies listed on the Singapore Stock Exchange using the Palic model to measure intellectual capital. The findings revealed a link between intellectual capital and its components and current performance. Intellectual capital also has a significant impact on the business unit's future performance. The rate of intellectual capital growth is related to financial performance and performance. Each industry's intellectual capital is unique.

Namazi and Ebrahimi (2009) looked at the effect of intellectual capital on the financial performance of companies listed on the Tehran Stock Exchange. The findings demonstrated that there is a large and positive association between intellectual capital and current and future financial performance, both at the company and industry levels, regardless of the company's size, debt structure, or historical financial performance. Irji Rad and Eslamdoost (2014) investigated intellectual capital components. According to the findings of their study, human capital has a significant and positive relationship with the performance criterion of systematic risk ( ) and



structural capital has a significant and negative relationship with systematic beta risk. However, physical capital has no significant relationship with this criterion of performance. Also, out of the three components of intellectual capital, the two components of human capital and physical capital have a significant positive relationship with the functional criterion of Q-Tobin (Q), but structural capital does not have a significant relationship with this performance criterion. Thus, due to the lack of research on the effect of intellectual capital on financial performance (Q-Tobin index here) in the statistical population of Iraq stock companies, the hypothesis of this research is explained as follows: There is a significant relationship between intellectual capital and Q-Tobin companies listed on the Iraq Stock Exchange.

#### **RESEARCH METHODS**

The current study is employed to achieve the purpose. Its nature and approach are descriptive-correlational, since it analyses the current situation and using regression analysis to discover the link between various variables. Because of the nature of the study, the data and information needed came from financial statements of companies registered on the Iraq Stock Exchange. After gathering the relevant data and information, it was loaded into Excel software to prepare it for transfer to statistical software. Eviews-9 statistical software was used to analyze the data. This research is classified as correlational-post-hoc research.

#### **Statistical population and sample**

The statistical population of companies registered on the Iraq Stock Exchange was used to choose the sample for this study. The sample companies were chosen using a systematic elimination approach that comprised individuals of the population who satisfied the following criteria: This study's statistical population includes all firms that were listed on the Iraq Stock Exchange from 2012 to 2018 and met the following criteria:

- 1- To be listed on the Iraq Stock Exchange by the end of 2018.
- 2- Companies have not changed their fiscal year during the desired periods.
- 3- The desired companies have been active during the research period and their shares have been traded.

4- Providing the full financial information required to conduct this research in the period of 2012 to 2018.

5- Not be among the banks' investment companies and financial intermediation.

In the present study, the screening method (elimination) was used to determine the statistical sample. Accordingly, companies that meet the requirements of the statistical population were selected and examined as a sample and other companies were eliminated after applying the above restrictions.

After applying the statistical population, the research sample was obtained. Then, information about research variables for these companies was obtained. The number of companies in the Iraq Stock Exchange is as follows



Table 1- Table of selection of available statistical population

Description	N
Number of companies listed on the Iraq Stock Exchange by the end of 2018	129
(-) Financial, investment, intermediation	58
Remained	71
(-) Number of companies that their information was not available.	38
Number of companies studied	33

Based on the mentioned conditions, 33 companies-years in the period of 2012 to 2018 were selected as the available statistical population.

Research variables and model

In this research, we deal with the relationship between intellectual capital and financial performance of listed companies.

$$Q\text{-Tobin} = \beta_0 + \beta_1 IC_{it} + \beta_2 Large_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 SEGMENT_{it} + \beta_6 INDB_{it} + \beta_7 MOWN_{it} + \beta_8 AGE_{it} + \beta_9 \sum IND_{it} + \beta_{10} \sum Year_{it} + \varepsilon_{it}$$

Independent variable:

IC: Intellectual Capital

The intellectual capital ratio for company  $i$  is calculated according to the following formula:

$$VAIC_i = CEE_i + HCE_i + SCE_i$$

Where,  $VAIC_i$  is the intellectual capital factor for Company  $i$ ,  $CEE_i$  is the relational capital coefficient for Company  $i$ ,  $HCE_i$  is the human capital factor for Company  $i$ , and  $SCE_i$  is the structural capital factor for Company  $i$ .

Relational capital CEE

It is relational capital efficiency that is an indicator of value-added efficiency based on relationships. The efficiency of relational capital is used with the following formula

$$CEE = \frac{\text{company value-added}}{\text{Company net book value of assets}}$$

Value-added is the surplus wealth generated by a company through the process of production or provision of services, which is obtained by deducting intermediate inputs (such as the cost of purchases) from revenues.

$$VA_i = \text{tax} + \text{salary cost} + \text{interest cost} + \text{net earnings}$$

Human capital HCE

The human capital efficiency is an indicator of the efficiency of value-added based on human capital. The following formula is used to calculate the coefficient of human capital efficiency.

$$HCE = \frac{\text{company value-added}}{\text{Total sum invested for salaries and wages of company}}$$

Structural capital SCE

Capital efficiency is a structure that is an indicator of value-added efficiency based on structural capital. The following formula is used to calculate the coefficient of human capital efficiency.

$$SCE = \frac{\text{structural cpital of company}}{\text{value-added of company}}$$

$SC_i$  is the structural capital of the company, for which the following formula is used.

$$SC = VA_i - HC_i$$

Where,  $SC_i$  is the structural capital of company  $i$ ,  $VA_i$  is the total value of the company  $i$ , and  $HC_i$  is the sum invested for the salary of company  $i$ .

Dependent variable:

To measure the financial performance of the company, the Q-Tobin index was used:

Q Tobin: It is obtained by division of the market value of assets (book value of debt plus market value of equity) to the book value of total assets of the company

$$Q \text{ Tobin} = \frac{\text{Stock market value} + \text{debt book value}}{\text{book value of all assets}}$$



Control variable:

SIZE: Natural logarithm of average sales and assets

Large: Percentage of shares in the largest shareholder

LEV: Debt to asset ratio

$$LEV = \frac{\text{debt}}{\text{asset}}$$

SEGMENT: Number of subsidiaries

INDB: Independence of the board that to measure it, the ratio of the number of non-executive directors to the total number of board members is used.

Has been

$$INDB = \frac{\text{number of non-executive directors}}{\text{total number of board members}}$$

MOWN: Percent of shares held by board

Age: Age of the company is the interval between the year of entering the stock exchange and the desired year

IND: Industry under study

Year: entering year

### Research results and hypothesis testing

Table 2 - statistics indices of variables

Test type	Statistic	sig
Chow	6.24	000.0
Hausman	34.37	000.0

Descriptive research model

On the other hand, the significance value of Hausman test, which is performed to examine the effects of fixed versus random effects, is 0.000 for the model

The small discrepancy between the median and mean in Table 2 implies that the variables are normal. Low standard deviations are also found in variables, indicating that data is distributed uniformly. The financial leverage variable has a mean of 40%, which suggests that 40% of the assets of the organizations analyzed are financed by indebtedness on average. The return on assets variable has a mean of 11%, implying that on average, 11% of the book value of assets in the studied companies has been converted into net earnings. The Q-Tobin variable likewise has a mean of 3, indicating that the market value of assets in publicly traded corporations is 3 times their book value.

#### Testing hypothesis

Before fitting the regression model and testing the hypothesis, it's important to figure out which regression model is best for the job. As a result, we employ the Chow test. The null hypothesis in this test is that the regression model fit is pooled, while the alternative hypothesis is that the regression model fit is panel. The F-Limer test statistic is 6.24, with a significance of 0.000 and a probability of less than 5%, so the alternative hypothesis is accepted and the null hypothesis is rejected, as shown in Table 3. In other words, a panel regression (p-value =0.000 0.05) will be used to fit the data.

and is less than 5%. Therefore, the model test will be performed as a panel with fixed effects.

Table 3- F-Limer (Chow) and Hausman test for the second hypothesis



To test the hypothesis, the preconditions of the model fit are first examined. According to Table 4, the Fisher statistic value is 0.000, indicating that the model is well-fitting. The adjusted coefficient of determination is 0.671 as well. In other words, independent variables account for around 67 percent of the dependent variables. In addition, the Durbin-Watson statistic, which has a value of 2.08, is between 1.5 and 2.5, indicating that model errors are not autocorrelated. The intellectual capital variable has a substantial value of 0.405 and a positive direction. To put it another way, the second hypothesis is wrong, because there is no link between intellectual capital and the Q-Tobin of companies listed on the Iraq Stock Exchange. The company size shows a substantial link with Q-Tobin among the control variables.

Operational definition	Symbol	mean	median	SD	Min	Max
Human Capital	HCE	3.5437	1.5256	31.5849	-211.50	97.0250
Communication capital	CEE	0.2134	0.2013	0.8593	-4.9356	5.3472
Structural capital	SCE	0.3199	0.7448	5.801	-58.10	29.2903
Intellectual Capital	IC	4.0769	2.4462	32.377	-215.4309	99.1622
Market value to book value of assets	QTUBIN	2.385	0.927	4.612	0.004	35.285
Percentage of shares held by the largest shareholder	Large	0.4849	0.4800	0.2110	0.1300	0.9050
Company size	SIZE	8.6289	8.5462	1.3997	5.3083	12.7664
Financial Leverage	LEV	0.4090	0.2917	0.4117	0.0050	2.1167
Company life	AGE	32.1364	28	14.9083	8	72





Table 4 - Hypothesis test results

Q-Tobin = $\beta_0 + \beta_1 IC_i + \beta_2 Large_i + \beta_3 SIZE_i / t + \beta_4 LEV_i t + \beta_5 SEGMENT_i t + \beta_6 INDB_i t + \beta_7 MOWN_i t + \beta_8 AGE_i / t + \sum IND_i t + \sum Year_i t + \epsilon_i$					
	Variable	Coefficient	SD	Statistic t	sig
Fixed coefficient	C	86.904	12.552	6.923	0.000
Intellectual capital	IC	0.013	0.015	0.836	0.405
Percentage of shares held by the largest shareholder	Large	0.83	1.411	0.588	0.558
Company size	SIZE	-9.531	1.361	-6.988	0.000
Financial Leverage	LEV	-4.234	2.477	-1.730	0.087
Number of subsidiaries	SEGMENT	-3.072	1.754	-1.751	0.083
Independence of the board	INDB	2.316	2.776	0.834	0.406
Percentage of shares held by the board	MOWN	0.345	1.443	0.420	0.810
Company life	AGE	0.022	0.040	0.550	0.583
Fisher statistics					6.787
Significance of Fisher statistics					0.000
The coefficient of determination					.787
Adjusted coefficient of determination					0.671
Durbin-Watson statistics					2.080

### DISCUSSION AND CONCLUSION

Without a doubt, today's organizations rely on their employees' knowledge and skills as well as new technology to succeed, rather than assets such as machinery. Intellectual capital has recently emerged as a significant driver of business value creation. The market worth of a corporation can be many times or even ten times its book value, with the difference representing the value provided by intellectual capital. Intangible assets generate value that isn't necessarily visible in financial statements. Intangible assets, on the other hand, are an essential component of firm performance, according to leading companies in this industry.

In today's world, the developing discipline of intellectual capital has piqued the interest of both researchers and organizational practitioners, and numerous fields have made major efforts to apply intellectual capital concepts. Accountants, for example, want to calculate the return on investment with it, IT

professionals want to codify it in information systems, sociologists want to balance power with it, psychologists want to develop minds, and education and development staff want to use it in human resource development programs. Intellectual capital offers a completely new model for observing the true value of organizations and can be used to calculate the company's future value. Intellectual capital can be used to create wealth. Thus, intellectual capital is considered as a kind of asset. Knowledge is not new, but its acceptance as corporate capital is a new issue. As a result, in the third millennium, when intellectual capital rather than financial capital is the main foundation for the dynamism and future success of participating in a knowledge-based economy, managers should determine the main sources and drivers of performance and value in organizations, because increasing cognition and utilizing intellectual capital helps organizations become more efficient, effective, productive, and innovative. Furthermore, a



company's competitive success is determined to a greater extent by the strategic management of intellectual capital than by the strategic deployment of physical resources. There is a considerable association between intellectual capital and Q-Tobin enterprises registered on the Iraq Stock Exchange, according to this research hypothesis. The findings of the study refute this idea. The intellectual capital variable has a substantial value of 0.405 and a positive direction. To put it another way, this concept is debunked, and there is no link between intellectual capital and the Q-Tobin of Iraqi companies listed on the stock exchange. The company size shows a substantial link with Q-Tobin among the control variables. The findings of this study agree with those of a study conducted by Iraj Rad et al (2014). For further investigation, the following suggestions can be made:

-For future studies, it is recommended to investigate the impact of variables such as management characteristics, types of control mechanisms, management accounting systems, etc. on financial performance. Also, it is recommended to examine the impact of effective risk management on new financial performance indicators such as economic value-added, cash value-added and market value-added.

-Also, the role of effective risk management in improving market performance indicators such as stock returns, price-to-earnings ratio, trading volume, etc. can be examined and other methods such as balanced scorecard, research and development costs, etc. can be used to measure intellectual capital.

-Finally, Future research can examine the relationship of intellectual capital with non-financial performance indicators such as customer satisfaction and loyalty, market share, job satisfaction of employees, etc. Also, the model of this research can be tested separately for different manufacturing and service industries of the Iraq Stock Exchange.

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