



Impact of Intellectual Capital on Economic Performance: A Case Study of El-Aurassi Hotel Chain Using VAIC Model(2010-2020)

Zeyneb Tamrabet^{*(1)}

Aicha Selma Kiheli ⁽²⁾

zinebtamrabet8t@gmail.com

selmaboussar@yahoo.fr

University of Setif 1,Algeria

LUEDLD University of KasdiMerbah ,Ouargl

Yazid Tagraret⁽³⁾

yazidtagraret400504@gmail.com

University of Larbi Ben M'hidi, Oum El Bouaghi

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Abstract :

This study seeks to illustrate how intellectual capital influences economic performance, employing the Value Added Intellectual Coefficient Model (VAIC) in a case analysis of the El-Aurassi hotel chain spanning the years 2010 to 2020.

The efficacy of intellectual capital has been measured through its key components, including human capital efficiency, structural capital efficiency, and working capital efficiency. Economic performance is gauged through growth, productivity, profitability indicators, and technological utilization. Employing an experimental approach, the study focuses on the El-Aurassi Chain Hotel listed on the Algiers Stock Exchange. The findings affirm a statistically significant impact of intellectual capital on the economic performance of the El-Aurassi Hotel chain throughout the period from 2010 to 2020.

Key word: Efficiency of intellectual capital, VAIC model, Economic performance, El-Aurassi Chain Hotel.

^{*}Corresponding author: Zeyneb Tamrabet

1. Introduction

Intellectual capital has become a critical factor in improving the performance of organizations, as the main reason for the underdevelopment of developing countries is their failure to properly invest intellectual capital, unlike developed countries, which consider intellectual capital to be the real means of creating added value and future economic wealth that is not sustainable in the long term.

In seeking to create a competitive advantage and create a capacity for renewal and innovation, organizations rely more on intangible assets, focusing on levels far from book value. Can be incorporated case of some companies, which achieved qualitative leaps in value by relying on their intellectual capital. For example, IBM achieved a market value of 70.7 Dollars billion in 2000, while its book value was only 16.7 billion Dollars. The US company (MICROSOFT) made profits of more than 6 billion dollars by only (6 to 8) employees representing intellectual capital, which was estimated to be worth between (67 to 91.6) billion dollars. Therefore, company managers felt the invisible side of intelligence and believed that by combining cognitive elements such as innovation and attention to intellectual capital, more value added and improve the economic performance of organizations.

Based on the above, we formulate the problem of the study as follows:

How does the intellectual capital efficiency impact the economic performance of the El-Aurassi hotel chain throughout the period (2010-2020)?

From this problematic emanate the following questions:

- What are the components of intellectual capital?
- How is economic performance assessed in economic institutions?
- Is there an impact of intellectual capital on the economic performance of the El-Aurassi hotel chain during the period (2010-2020)?

1.1 Research hypotheses:

The research is based on the following assumption test: (there is a statistically significant moral impact of intellectual capital on the economic performance of the El-Aurassi hotel chain during the period (2010-2020)).

1.2 Importance of research:

Research derives its importance from the interest of the concept of intellectual capital at the theoretical and applied level summarized in the following points:

- The importance of the concept of intellectual capital is related to the ability of the enterprise to improve its economic performance in order to enhance its competitiveness and ensure its survival;
- To know the role of intangible assets in transforming knowledge into value;
- The role of intellectual capital in generating the value of the enterprise has moved from the exploitation of natural resources(tangible) to the exploitation of intellectual assets (intangible);
- The importance of the field aspect that shows the impact of intellectual capital on the economic performance of an Algerian institution represented in the El-Aurassi hotel chain during the period (2010-2020)?

1.3 The research methodology:

In order to achieve the objectives of the study and respond to the research problematic, an experimental approach based on the use of quantitative data extracted from the closing financial statements and reports of the El-Aurassi hotel chain during the period (2010-2020). The El-Aurassi financial reports were also used to measure and link knowledge assets and intellectual capital, for the purpose of finding the state of interaction that reflects the variables of economic performance in economic institutions.

2. The theoretical framework of intellectual capital:

The term intellectual capital has been abundant in studies that have addressed it and provided theoretical rooting for it, as an outlet for organizations to achieve competitive advantage and create economic value. It is the true hidden wealth, embodied by activating the innovative process and transforming knowledge into added value. Today's institutions weigh intangible assets (the reflection of intellectual capital) against tangible assets, with over 80% of global leading companies relying on them (Choong, 2008).

2.1 The historical context of the development of intellectual capital:

Although the term –intellectual capital-is relatively recent in management thought, the historical roots that contributed to its adoption stretch back to the Middle Ages, especially the 18th and 19th centuries. The economist Adam Smith mentioned it through his book (wealth of nations), when he addressed the impact of the skills of workers in the productive process and the quality of output, and demanded that wages be determined according to the effort, time and cost of the worker to earn and develop their human abilities and skills. Alfred Marshall stressed the importance of investing in humans as not subject to the diminishing benefit act (Dumay, 2014).

Continue contributions to economic thinker in an attempt to highlight the importance of intellectual capital, is to make products considering its importance and its intangible assets as the secret of the success of home owners do not. The 1980s marked the turning point for companies and management thought leaders in their handling of intangible assets, culminating in 1990 with Ralph Stayer's first use of the term intellectual capital, followed in 1991 by the appointment of Edvinsson as the first director of intellectual capital management at the Swedish insurance and financial services company Skandia(Harrison & Sullivan, 2000).

Thus, research on the theme of intellectual capital began to evolve due to the culmination of specific theories on this subject. In 1995, a meeting was held with the

participation of representatives of eight companies, called "Intellectual Capital Management", in which the basic concept of intellectual capital, along with the principles, practices and methods of calculation were agreed upon. It ended with the release of the first annual intellectual capital report from the Swedish company Skandia.

2.2 Definition of intellectual capital:

The recognition of the significance of intellectual capital by business practitioners, as a key differentiator impacting the market and book value of enterprises and creating value for shareholders and society at large (Vidma Marti, 2007, p. 245), has led to multiple dimensions in its definition. Initially described by (Edvinsson, 1997) as: "the difference between the company's market capitalization and the book value of the entity", it was further elaborated by (Sveiby, 1997) as encompassing: "resources and knowledge stored in the operations of the system databases, enterprise, culture, and philosophy". (Stewart & Ruckdeschel, 1998) considered it: "the substance of any knowledge, information, intellectual property and experience that can be used to create wealth". In an accounting context (Bontis N., 2005) defined it as: "the collection of intangible resources and their flows that contribute to the company's value generation processes".

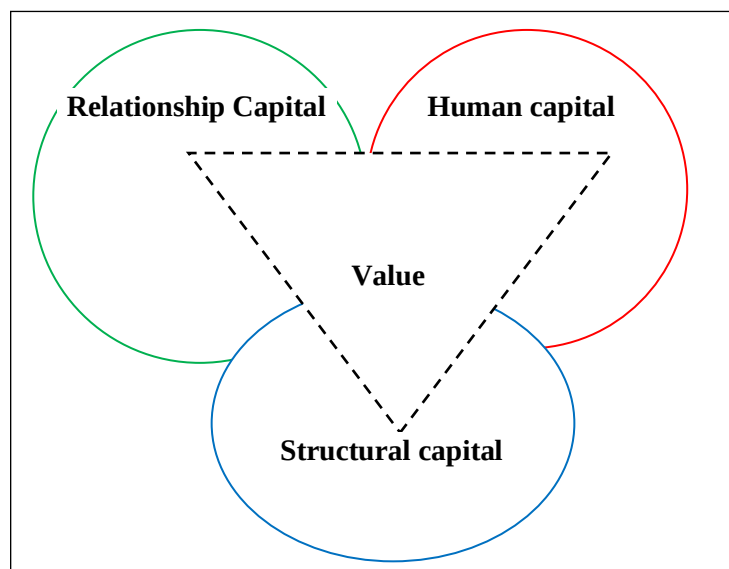
Subsequent definitions of it focused on its components, with (Shehzad, Fareed, Zulfiqar, Shahzad, & Latif, 2014) defining it as "the constituent factors of knowledge, experience, information and skills". (Giuliani, 2016) views it as: "all information, resources and resources of a company or organization may contribute to maximizing profit, from attracting on new customers, improving innovation capacity, seamless communication between stakeholders and polishing employee efficiency". (Javed & Jahan, 2017) describe it as "motor, intellectual, experience, knowledge, and intellectual property and information that create value and competitive advantage to the organization".

2.3 Classifications of intellectual capital:

Classification of intellectual capital is a difficult challenge because the boundaries of its elements is loose and can be isolated from each other .From a perspective (Robinson & Kleiner, 1996) classifies intellectual capital into human capital, structural capital. (Bountis, 1999) adds third classification of drunk capital in customer relations, this is confirmed by (Bueno, Salmador, & Rodriguez, 2004). Intellectual capital is also divided into four components, according to the ranking of the Brookings Institute, including market assets, human assets, intellectual property rights, and infrastructure assets(Taher, 2019, p. 107).

Thus, most studies have relatively agreed that intellectual capital was not multidimensional, residing at different levels based on three main components, They are shown in the following figure

Fig. 1: components of intellectual capital



Source:(chatzkel, 2002, p. 37).

From the figure it becomes clear that the basic components of intellectual capital include Human capital Is the knowledge that her staff with them when they leave the company. Includes knowledge, skills, experience and abilities of people. Structural capital Knowledge that remains within the company at the end of the working day. It

includes organizational actions, procedures, systems, cultures, databases, etc . Relationship Capital (clients) All resources associated with the external relations of the company, with customers, suppliers or R & D partners. This part includes the human and structural capital associated with the company's relations with stakeholders (investors, creditors, customers, suppliers, etc...

3. Measuring intellectual capital:

measuring intellectual capital contributes to its ability to create wealth and added value for organizations, as an intellectual asset whose efficiency and effectiveness can be judged by its measurement.

3.1 Concept of value-added coefficient method:

The intellectual value added coefficient (VAICTM) is a method devised by the Austrian Center for Intellectual Capital Research (aicrs) under the leadership of Professor ante(Pulic A. , 2000)measures the efficiency of key resources in companies. The VAIC methodology has been widely used internationally and strongly tested by researchers (Pulic and Bornemann, 1997; Pulic, 2000; Pulic, 2004; Ho and Williams, 2003; Goh, 2005; Kamath, 2007; Muhammad and Ismail, 2009; Chang and Hsieh, 2011; Joshi et al., 2013).VAIC presents a new concept of "corporate intellectual capacity" and refers to the total efficiency of creating value for the company due to two key resources considered as a mechanism for measuring IC (Pulic A. , 2004).

- Capital employed: it consists of financial capital and physical assets;
- Intellectual capital: composed of human IC and structural IC.

3.2 Value-added coefficient calculation method:

the value-added coefficient method is applied as follows:

Table 1. Value-added coefficient calculation method:

Indicator	Relationship
Value added	Total revenue-commodity supplies (fiscal year amortization) $VA=OUT-In$
Human capital	Salaries and wages
Structural capital	Value added- Human capital $SC=VA-HC$
Working capital(IC)	Current assets – current liabilities
Human capital efficiency	Value added / human capital $HCE= VA/ HC$
Capital efficiency, structural	Value added / structural capital
Efficiency of working capital	Value added/Working Capital $CEE =VA/CE$
The efficiency of intellectual capital	Human capital efficiency + structural capital efficiency+ working capital

Source: Prepared by researchers based on (murni, yurniwati, & rizal, 2015).

4. Measuring Economic performance:

Economic performance is intended to provide a valuable judgment on the management of natural, material and financial resources united, and the extent to which the management of an enterprise is able to satisfy the benefits and desires of its various parties". The process of assessing economic performance is the conscious ability of senior management to make good use of various means of production, to achieve certain predetermined goals, to diagnose deviations and bottlenecks and to find effective solutions to them. This requires the correct and accurate documentation of data and information on performance, working conditions and behaviour of workers in order to avoid future deviations, to expand on the positive aspects as much as possible and to achieve the desired objectives for which the economic unit was created(Al-Mamari & Mawla, 2010, p. 3).

Table 2.Economic performance indicators

Indicator	Relationship	
Growth indicators	Income growth rate	Current year net income / last year net income
	Sales growth rate	Current year sales / last year sales
Production indicators	Ratio of production development	Current year realized production value/ last year realized production value
Productivity indicators	Labor productivity	Value added / number of employees in the enterprise
	Fixed capital productivity	Production value or (added value) / the value of machines and equipment
Profitability indicators	Profit margin	Net operations(profit – tax)/ sales value
	Evolution of gross profit	Current year earnings / last year earnings
The degree of technology used	Fixed assets used machines and equipment/ total salaries and wages	

Source: Prepared by researchers based on(Al-Mamari & Mawla, 2010)

5. Pratical study:

The El-Aurassi hotel is one of the most important hotels in Algeria and is one of the oldest hotels in the capital affiliated to the public sector, which has a 5-star Mark and offers the finest and finest contemporary services.

5.1 Definition of the El-Aurassi hotel chain:

The El-Aurassi Foundation, inaugurated on June 2, 1975, initially operated under the Ministry of Tourism and Culture, subsequently transitioning management through entities like the National Company for Tourism and Hotels (Sonatour) and the Algerian Company for Tourism and Hotels (ALTOUR) until 1983(www.sgbv.dz).

Currently overseen by the General Services Holding Corporation, it boasts a social capital of 1.5 billion Algerian dinars, equivalent to 60 million shares with a nominal value of 250 DJ. In 1999, 20% of its shares were introduced on the Algerian Stock Exchange. The brokerage process involves financial entities such as Financial Adult, Sogefi, Soficop, and SPDM(www.sgbv.dz).El-Aurassi company, operating as a

hotel chain, utilizes a renowned brand and enjoys benefits like job security, access to international reservation systems, enhanced hotel services, and increased capital investment, thereby incorporating intangible values into its intellectual capital.

5.2 Measurement of the intellectual capital of the El-Aurassi hotel chain during the period (2010-2020):

In order to measure the intellectual capital of the El-Aurassi hotel chain the method of the cognitive value-added model is used during the period (2010-2020). This is based on Table No. 03 to calculate the results of calculating the efficiency of the intellectual capital of the hotel chain for the purpose of applying the VAIC model as described in in Figure 02.

From the results presented in Figure 02, the efficiency of intellectual capital in the El-Aurassi hotel chain reached its highest level in 2012 by 15.52%, stabilizing during 2013-2018 within the field (5.85 in 2016 to 6.75 in 2013). It then partially declines in 2019 to 4.88%. In 2020, there was a marked decline in its rate (-9.62%).

The value observed in 2012 can be explained by the hotel's entry into the rehabilitation program, which included a series of changes, the most important of which:

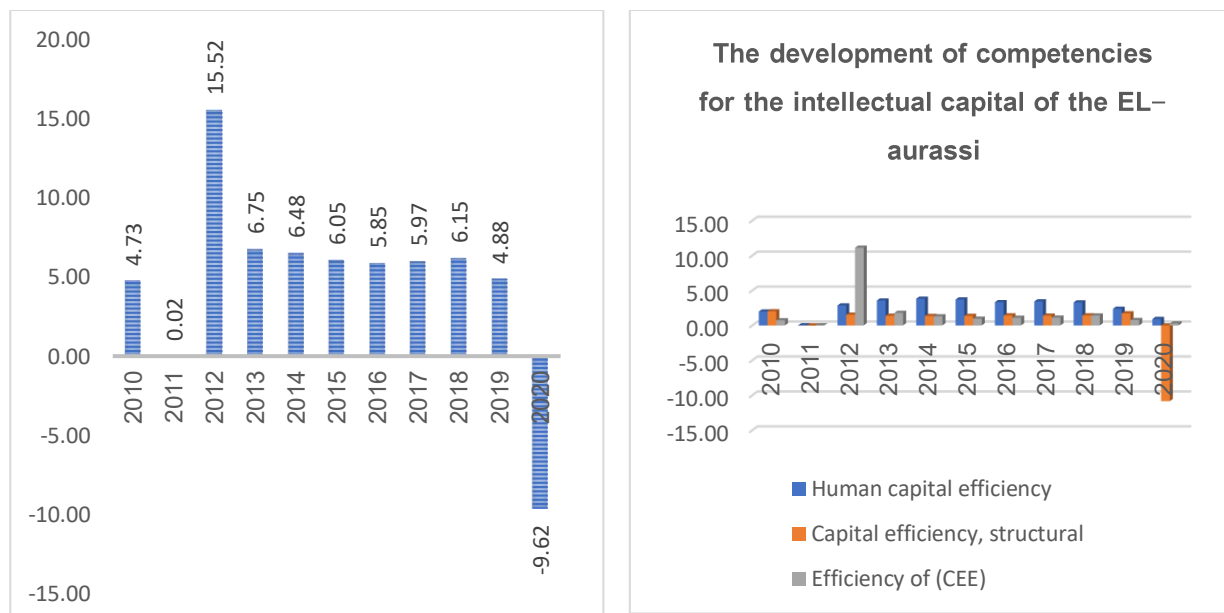
- Renovation and repair depth of buildings;
- Establishment of new international standards of reception and security;
- Improve the appearance and shape of the interior and exterior of the Capital Hotel;
- Develop programs to offer services, including the size of the hotel and the skills of his employees.

These changes are reflected mainly in the efficiency of working capital, which reached a value of 11.12%, followed by human capital efficiency, which focused hotel chain El-Aurassi integration and rehabilitation of human resources in line and its position in the domestic and international market.

The efficiency of human capital was stabilized in the following years as a result

of the continuation of the renovation program that extended the units at the southern level (Al-Reem hotel in Bani Abbas, Al-Mahri bourqla and Al-Bustan in Al-mannaia), but the policy adopted by the Algerian state, through which it supported the opening of hotels to the private sector, This reflected negatively on the efficiency of the intellectual capital of the hotel, which was observed to decline in 2019 and its decline in 2020, which was caused primarily by the decline in the efficiency of structural capital as a result of the epidemic situation that swept both the world and Algeria, and which stopped all economic activities.

Fig 2.Efficiency of intellectual capital in the El-Aurassi hotel chain during 2010-2020



Source: prepared by the authors researchers based on the study s results

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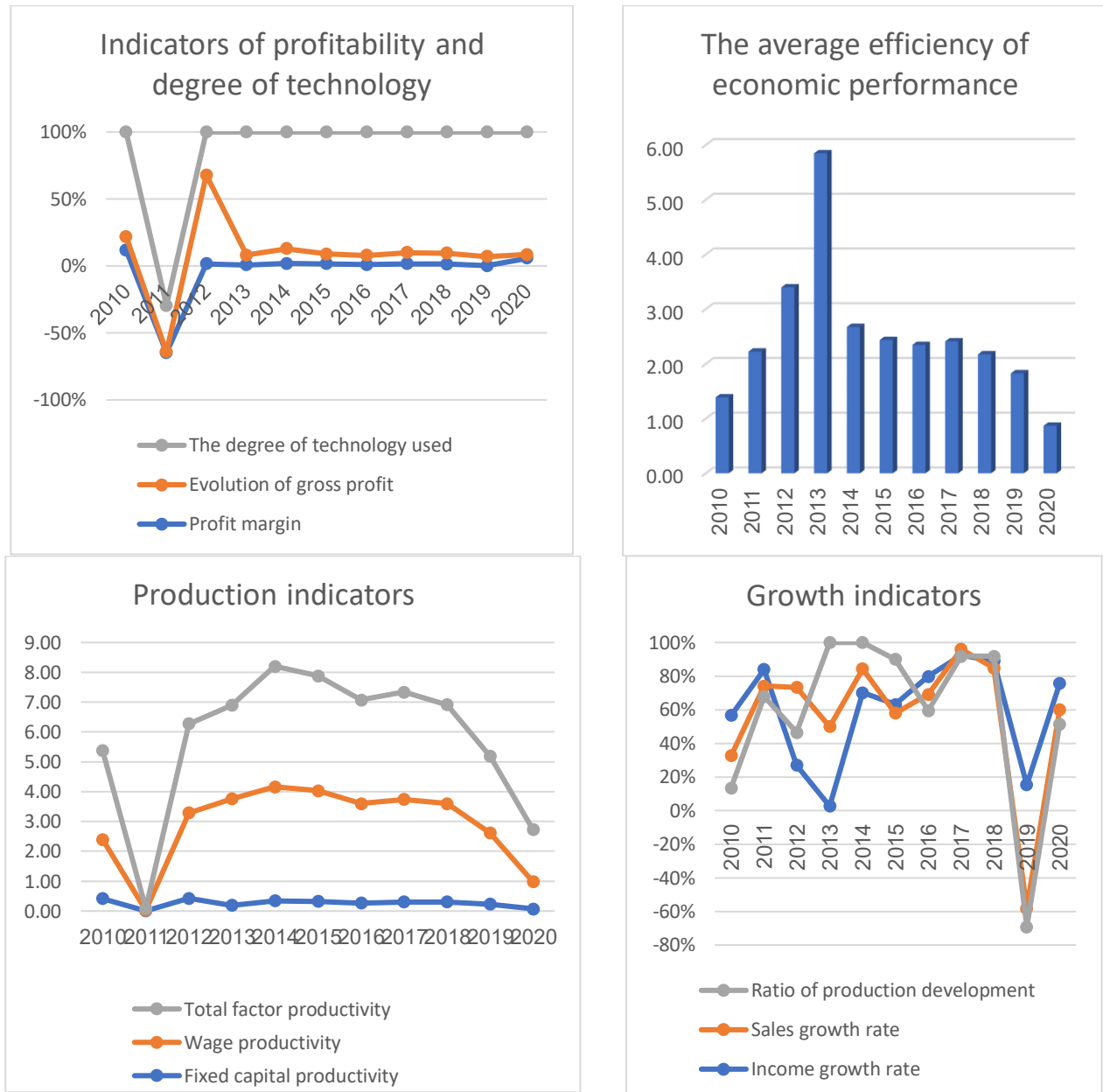
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5.3. measurement of the economic performance of the El-Aurassi hotel chain during the period (2010-2020):

In order to calculate the economic performance of the Eurasian hotel chain during the period (2010-2020), the financial ratios described in the theoretical part of the study were relied on.

Fig3. Economic performance of the El-Aurassi hotel chain during 2010-2020



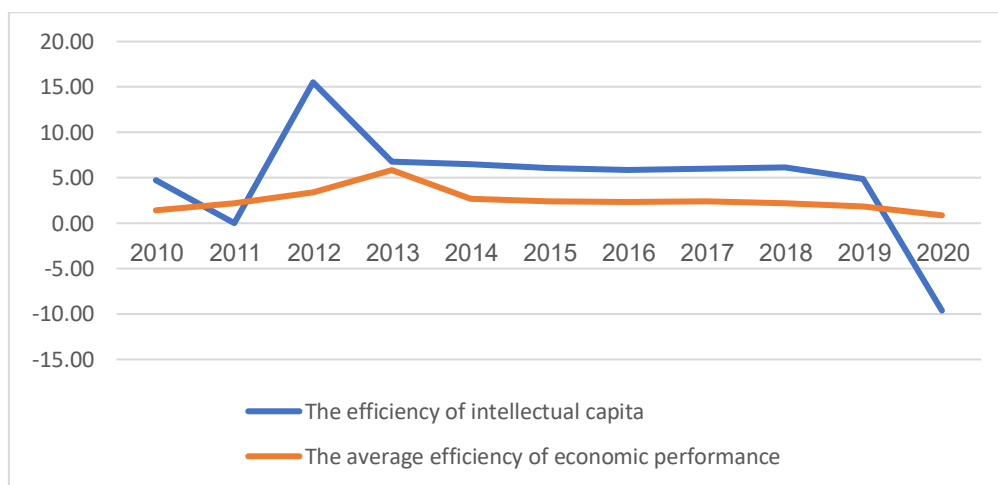
Source: prepared by the authors researchers based on the study s results

It emerges from the figures collected from that the economic performance of the El-Aurassi hotel chain was generally stable over the period (2014-2019), after reaching the highest level in 2013, the year following the rehabilitation program mentioned above.

The significant impact of productivity indicators which have improved since the first application of the program, in particular wage productivity, underlines the importance of human capital in increasing the economic performance of the El-

Aurassi hotel chain. However, the adopted program did not reflect significantly on the indicators of profitability and the degree of use of technology during the study period, in contrast to the growth rates that can be returned to transport the mobility of the foreign tourist who was mainly targeted by the El-Aurassi hotel chain.

Fig 4.Averages of intellectual capital efficiency and economic performance of the El-Aurassi hotel chain during the period 2010-2020



Source: prepared by the authors researchers based on the study s results

Table03: averages of intellectual capital efficiency and financial performance of economic units

Statement	El-Aurassi hotel
The average efficiency of intellectual capital	%4.40
The average efficiency of economic performance	%4.09

Source: prepared by the authors researchers based on the study s results

Figure 04 shows the average efficiency of intellectual capital, as well as the overall average efficiency of the economic performance of the El-Aurassi hotel chain during the period (2010-2020), where it is shown through the figure that the average efficiency of intellectual capital affects the average efficiency of economic performance by a delay of one year.

This is what we will show through the statistical analysis contained in Table 05.

Table 04: correlation matrix between the averages of intellectual capital efficiency and the efficiency of the economic performance of the El-Aurassi hotel chain

Corrélations				
			The average efficiency of economic performance	The average efficiency of intellectual capital
Rho de Spearman	The average efficiency of economic performance	Coefficient de corrélation	1,000	,855**
		Sig. (bilatéral)	.	,001
		N	11	11
	The average efficiency of intellectual capital	Coefficient de corrélation	,855**	1,000
		Sig. (bilatéral)	,001	.
		N	11	11

** . La corrélation est significative au niveau 0.01 (bilatéral).

Source: prepared by the authors researchers based on the study s results

We note from Table 04 the existence of a strong direct relationship between the efficiency of intellectual capital and average economic performance, where the value of the Spearman correlation coefficient is 85.5%. This is a statistically significant value at the 0.01 level. Also, the efficiency of intellectual capital is high thus contributing to the increase of the effect of the efficiency of intellectual capital.

The realization of this hypothesis leads us to try to understand the primary source of the correlation relationship that has been observed. For this we try to study below the partial correlation between the components of intellectual capital efficiency and economic performance. Which will discuss the following partial hypotheses:

- There is a statistically significant moral impact of human capital efficiency on the economic performance of the El-Aurassi hotel chain during the period (2010-2020).
- There is a statistically significant impact of structural capital efficiency on the economic performance of the El-Aurassi hotel chain during the period (2010-2020).
- There is a statistically significant impact of working capital efficiency on the economic performance of the El-Aurassi hotel chain during the period (2010-2020).

The results of the statistical analysis was as follows:

Table 05: correlation matrix between dependent and independent variables.

Corrélations						
			Human capital efficiency	Capital efficiency, structural	The efficiency of working capital (CEE)	Average economic performance ratios
Rho de Spearman	Human capital efficiency	Coefficient de corrélation	1,000	-,100	,627*	,718*
		Sig. (bilatéral)	.	,770	,039	,013
		N	11	11	11	11
	Capital efficiency, structural	Coefficient de corrélation	-,100	1,000	,273	-,118
		Sig. (bilatéral)	,770	.	,417	,729
		N	11	11	11	11
	The efficiency of working capital (CEE)	Coefficient de corrélation	,627*	,273	1,000	,745**
		Sig. (bilatéral)	,039	,417	.	,008
		N	11	11	11	11
	Average economic performance ratios	Coefficient de corrélation	,718*	-,118	,745**	1,000
		Sig. (bilatéral)	,013	,729	,008	.
		N	11	11	11	11

*. La corrélation est significative au niveau 0.05 (bilatéral).

**. La corrélation est significative au niveau 0.01 (bilatéral).

Source: prepared by the authors researchers based on the study s results

Through Table 05, which describes the correlation matrix between the dependent variable of average economic performance and the independent variables constituting the efficiency of intellectual capital, there is a strong direct correlation between average economic performance and the efficiency of human capital., where the value of the correlation coefficient is 71.8%. It is statistically significant at the significance level of 0.05. Thus, increasing the efficiency of human capital leads to an increase in average economic performance. We can therefore conclude, It is statistically significant at the significance level of 0.05. Thereby. This is due to the nature of hotel services, which primarily depend on the efficiency of human resources in delivering their services.

The table also shows that there is strong direct relationship between average economic performance and working capital efficiency, where the correlation coefficient reached a value of 74.5%. It is statistically significant at the significance level of 0.01. Thus, the increase on working capital contributes to the increase on the economic performance rates of the Al-Aurassi hotel chain.

While the results indicate that there is a weak, inverse and not statistically significant correlation between the efficiency of structural capital and economic performance ratios. It is due to the negative impact of the fixed assets which are included in the renovation program carried out, often in the short term, by the hotel. This does not exclude a positive impact on long-term economic performance.

6. Conclusion:

This study proves the validity of the basic hypothesis, which is: (There is a statistically significant moral impact of the efficiency of intellectual capital on the economic performance of the El-Aurassi hotel chain). It was confirmed by the partial hypotheses that addressed the components of intellectual capital efficiency: human capital efficiency, structural capital efficiency and working capital efficiency.

This confirms the importance of intellectual capital as an important variable with a significant impact on the success or failure of enterprises. It is one of the main pillars of the company to create strategic returns and resources and a competitive weapon, by providing outstanding minds with their intelligence and ability to invest the rest of the resources to expand the excellence of their organizations. It is also an imperative issue posed by the nature of the contemporary scientific and technological challenge.

In light of the above ideas and research in this field, the researcher achieves the following results:

- Investing in intellectual capital not only provides a competitive advantage in the

market but also leads to improved economic performance. This is achieved through effective guidance and management of intellectual capital, organizational techniques, professional skills, customer relations, and leveraging experience;

- The correct measurement and evaluation of intellectual capital and its partial components helps the entrprise to make effective decisions that contribute to raising its economic performance;
- Measuring economic performance helps management to provide information for making important decisions, whether for development or investment;
- The hotel industry is characterized by capital density and labour efficiency, which makes it achieve significant levels of human and structural capital efficiency, there byincreasing its intellectual capital efficiency;
- The presence of a robust and statistically significant positive correlation between the efficiency of El-Aurassi Hotel chain's intellectual capital and its economic performance throughout the period of 2010-2020 confirms El-Aurassi Hotel's commitment to effectively utilizing its physical and human assets and relationships to enhance and improve its economic performance.

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