

The Impact of Intellectual Capital on Enhancing the Competitive Performance of Algerian Economic Institutions: An Applied Study on a Sample of Institutions in the Adrar Province

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Abstract ;

This study aimed to analyze the impact of intellectual capital (human, structural, and relational) on competitive performance in Algerian economic institutions in the Adrar province. Using a descriptive-analytical approach and a questionnaire tool, the results showed a statistically significant positive influence of the combined components of intellectual capital on enhancing competitiveness. The study provides a theoretical contribution and a practical foundation to support decision-makers in strengthening their investments in knowledge management to achieve a sustainable competitive advantage.

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1. Introduction

The global economy has witnessed a fundamental shift in recent decades, moving from a traditional model based on the exploitation of material resources to a knowledge economy [Economy based on the production and use of knowledge as a primary resource], where intellectual capital is the main driver for enhancing corporate competitiveness. Recent studies have shown that intangible assets—foremost among them being intellectual capital with its three dimensions: human, structural, and relational—now constitute the largest proportion of the market value of leading global institutions, often exceeding 80%.

Specialized literature has confirmed that organizations which successfully manage their knowledge and transform it into added value achieve a tangible superiority in competitive performance. Human capital plays a pivotal role in developing innovative capabilities, while structural capital contributes to the development of internal processes and ensuring their continuity. Meanwhile, relational capital enhances the organization's ability to build strong networks with customers and partners.

Algerian economic institutions face intertwined challenges represented by the increasing intensity of competition in local and international markets, contrasted with their weak actual utilization of available knowledge resources. These challenges raise a central research problem concerning how to transform intellectual capital into an effective strategic tool to support competitive performance.

Research Problem:

This study focuses its research on the economic institutions in the Adrar Province as a field model reflecting the particularities of the economic environment in the Algerian south. The study aims to analyze the reality of intellectual capital management and measure the impact of its three components on improving competitive performance, by answering the main question: What is the impact of the three dimensions of intellectual capital on enhancing the competitive performance of economic institutions in Adrar Province?

Study Hypotheses:

Based on this, the following null hypotheses were formulated:

- **H₁⁰:** There is no statistically significant effect at the level ($\alpha \leq 0.05$) of human capital on the competitive performance of economic institutions in Adrar Province.
- **H₂⁰:** There is no statistically significant effect at the level ($\alpha \leq 0.05$) of structural capital on the competitive performance of economic institutions in Adrar Province.
- **H₃⁰:** There is no statistically significant effect at the level ($\alpha \leq 0.05$) of relational capital on the competitive performance of economic institutions in Adrar Province.

Significance of the Study:

The significance of this study stems from two aspects:

Theoretically, it seeks to fill a gap in national literature, as the relationship between intellectual capital and competitive performance remains a less addressed topic in the Algerian context compared to international literature.

Practically, its results provide applied insights that can help decision-makers in Algerian economic institutions adopt knowledge-based strategies, contributing to improving their competitiveness in light of rapid global economic changes.

Study Objectives:

The study seeks to achieve the following objectives:

- Diagnosing the reality of intellectual capital components in economic institutions in Adrar Province.
- Measuring the impact of human, structural, and relational capital on competitive performance.
- Formulating practical recommendations to help these institutions develop effective strategies to enhance their competitive performance.

Methodology and Study Tools:

This study adopted a descriptive-analytical approach [A research method that describes the characteristics of a phenomenon and analyzes causal relationships between its variables], given its suitability for describing the research phenomenon and analyzing the causal relationships between its variables. Data was collected via a questionnaire designed using a five-point Likert scale [A scale where respondents indicate their level of agreement, e.g., from Strongly Disagree to Strongly Agree]. The questionnaire included two main sections: the first aimed to measure the dimensions of intellectual capital (human, structural, relational), while the second section investigated indicators of competitive performance (excellence, innovation, flexibility, cost reduction, and creativity).

The tool was applied to a purposive sample [A non-random sample selected based on the researcher's judgment about who can provide the best information] consisting of managers and officials in public and private sector institutions in Adrar Province. For data analysis, the Statistical Package for the Social Sciences (SPSS version 20) was used. The statistical analyses included:

- Descriptive statistics (arithmetic means and standard deviations) to describe the sample responses.
- Cronbach's Alpha coefficient to measure the degree of reliability and internal consistency of the study instrument.
- Pearson correlation coefficient to test the correlational relationships between variables.
- Multiple regression analysis to measure the impact of the intellectual capital dimensions (independent variables) on competitive performance.

2. Theoretical Framework of the Study Variables

2.1 General Concepts of the Study Variables

2.1.1. The Concept of Intellectual Capital

Researchers and thinkers have differed in developing a comprehensive and unified definition of intellectual capital, due to its nature as a modern concept that emerged with the evolution of the knowledge economy. There are also numerous terms used to refer to intellectual capital, including intellectual capital, intangible capital, and intangible assets.

The concept of intellectual capital began to gain noticeable attention in the 1990s. It was first used by the researcher Edvinsson in 1993 in one of his books. Subsequently, "Forbes" magazine highlighted this concept in 1994 concerning the Scandinavian countries' exploitation of their intellectual assets. Among the most significant milestones that contributed to the spread of this concept was the publication of the book "Intellectual Capital: The New Wealth of Organizations" by researcher Thomas A. Stewart in 1997, which was one of the pioneering books to address the idea in depth (Belbal, 2023).

The term "intellectual" or "knowledge" is derived from the Latin word (Inter), meaning relationships, and (lectio), referring to reading and "library knowledge." By adding the term (Capital), the concept of "Intellectual Capital" is formed, which expresses a dense network of relationships based on knowledge and competencies, possessing latent potential to generate value (Malone & Edvinsson, 2010).

According to Malhotra, intellectual capital refers to intangible assets or knowledge assets that contribute to the organization's operations, enhance its growth, increase its value, and serve the interests of its stakeholders in the future (Stewart, 1997).

Thomas A. Stewart defines intellectual capital as "a set of intangible assets: knowledge, information, intellectual property, in addition to experiences that can be invested in assessing the economic value of the institution. Therefore, this concept is linked to two fundamental elements: acquiring knowledge and understanding and comprehending it." (Assi & Ismail, 2022).

In another definition, intellectual capital consists of the intangible assets within the institution, which include the knowledge, skills, and experiences possessed by individuals, enabling them to adapt to organizational changes within the institution (such as management methods and research and development capabilities), in addition to effective interaction with the external environment through enhancing its corporate image and building strong relationships with suppliers and customers (Hohou & Bouhafs, 2019).

Most accounting studies have agreed on classifying intellectual capital into three main categories (Cherifi, 2022):

- **Human Capital:** Refers to the mental capacities represented by experience, skills, and morale possessed by a select group of the institution's employees, which directly contribute to enhancing and developing its performance.
- **Structural Capital:** Embodied in the systems, rules, and organizational practices related to intellectual property, innovation, trademarks, along with quality control tools and information systems, which enable the institution to transform the potential capabilities of its human resources into effective practical applications.

•**Relational Capital:** Consists of a set of systematic procedures aimed at achieving customer satisfaction and earning their loyalty, thereby contributing to enhancing the institution's market share and solidifying its relationship with its clients.

2.1.2. The Concept of Competitive Performance:

Competitive performance is considered one of the central concepts that has gained increasing importance given the rapid economic and technological transformations and the dynamic environment in which institutions operate. Enhancing competitive performance has become a strategic objective that institutions seek to achieve to ensure continuity and realize growth in markets. Numerous definitions have addressed this concept from different analytical perspectives and applied fields.

Porter defines competitive performance as "the institution's ability to achieve sustainable superiority in the market, through maximizing the value delivered to customers, while maintaining the efficiency of internal operations and the ability to adapt to surrounding environmental changes." (Porter, 1985).

According to Barney, competitive performance "is based on the institution's ability to deploy its strategic resources and potentials, particularly those characterized by scarcity and difficulty of imitation, (intellectual capital) with the aim of creating added value that exceeds what competitors offer, thus enabling it to achieve a sustainable competitive advantage." (Barney, 1991).

Chen, Cheng, & Hwang view competitive performance as "a direct embodiment of the institution's efficiency in investing its intellectual capital to enhance its market value and improve its financial performance, through raising the level of operational efficiency, strengthening its innovative capabilities, and delivering added value to customers that surpasses what competitors offer."

A number of researchers indicate that achieving distinguished competitive performance cannot be realized in isolation from a set of strategic factors, most notably effective investment in intellectual capital, adopting a culture of continuous improvement at all levels of the institution, in addition to employing modern technology to support operations and innovation, as well as building long-term relationships based on trust and cooperation with customers and suppliers, as a fundamental lever for enhancing sustainable competitive advantage.

2.2 Previous Studies

[Bontis et al. (2000) Study] : This study aimed to develop scientific measurement tools to assess the impact of intellectual capital on the performance efficiency of institutions. The researchers adopted a survey methodology that included a sample of 150 Malaysian companies. Data were collected using a questionnaire designed to measure the three components of intellectual capital: human, structural, and relational. The results showed a statistically significant positive relationship between the level of intellectual capital development and organizational performance indicators. Variation in the intensity of this impact was observed according to the nature of the sector, where it became clear that the human element plays a pivotal role in knowledge-intensive institutions, while structural

factors and external partner relationships gained greater importance in service institutions. The study also succeeded in building a standard model that can be relied upon in future related research.

[Al-Ajlouni and Al-Zoubi (2017) Study] : This study aimed to analyze the impact of intellectual capital with its three components (human, structural, relational) on achieving sustainable competitive advantage in the Yemeni food industry sector. The research adopted the analytical descriptive approach, encompassing all large companies in this sector totaling 16 companies (with 5,416 employees). A disproportionate stratified random sample of 359 individuals was selected, using a specially designed questionnaire for data collection. The results showed that the relational capital dimension had the greatest impact on achieving competitive advantage, followed by human capital, then structural capital. It also recommended the necessity of enhancing the efficiency dimension, as it was the least achieved, while continuing to support the development of intellectual capital as a sustainable strategic source for competitive advantage.

[Mabrouk (2022) Study]: On the impact of intellectual capital in Saudi higher education institutions, it aimed to analyze the role of the three components (human, structural, relational) in achieving competitive excellence. The study adopted a quantitative methodology using an electronic questionnaire administered to a sample of academics and administrators, with data analysis using SPSS. The results revealed variation in the impact of the components, with relational capital recording the highest impact on competitive excellence, followed by human capital then structural capital, while the innovation dimension was the least achieved. In light of these results, the study recommended adopting effective strategies including: enhancing knowledge management, optimal investment in human capital, and consolidating internal and external institutional relationships to ensure sustainable competitiveness for Saudi universities.

[Kılıçlı (2022) Study]: This study aimed to analyze the results of previous studies that addressed the relationship between intellectual capital and competitive advantage using meta-analysis methodology. The researcher relied on aggregating data from 71 studies published in 14 national and international academic databases, with a total sample size of 15,625 individuals. Pearson correlation coefficient was used as a unified measure of relationship, applying the random effects model to analyze the average effect size through CMA software. The results showed that the overall effect size reached 0.490, reflecting a strong positive relationship between intellectual capital and competitive advantage, confirming the hypotheses and conclusions reached by previous literature in this field.

[Khudhair et al. (2022) Study]: This study aimed to analyze the impact of intellectual capital components on achieving competitive advantage within Iraqi telecommunications companies. The researchers used the quantitative method relying on a questionnaire to

collect data from a sample of employees in these companies, and the results were analyzed using descriptive and inferential statistical methods. The results revealed that both structural capital and relational capital have a direct positive impact on competitive advantage, contributing 48.4% to explaining the differences in competitive performance. While human capital did not show a direct impact, it exerts an indirect influence through its correlation with relational capital. The results also showed statistically significant differences in the impact of relational capital according to gender and age, with the greatest impact among younger males, while the impact of structural capital was more evident among females.

3. The Applied Part of the Study

3.1 Methodology and Study Tool

3.1.1 Study Methodology:

To address the research problem and verify the hypotheses, 43 questionnaires consisting of two dimensions containing 53 items were distributed to a purposive sample represented by managers and officials of planning, management, and human resources units in active public and private economic institutions in Adrar Province, due to their important role in activating intellectual capital components and achieving competitive performance within the institution.

3.1.2 Study Tool:

The study relied on a questionnaire constructed according to a five-point Likert scale to ensure accurate and comprehensive data collection. It included two main dimensions: the first measured the dimensions of intellectual capital (human, structural, and relational) through 31 items, while the second dimension addressed competitive capability indicators (excellence, innovation, flexibility, cost, creativity) through 22 items, thus providing comprehensive coverage of the research variables.

Table (1): Distributed and Retrieved Questionnaires

Sample Size	Distributed Questionnaires	Percentage	Retrieved Questionnaires	Percentage	Lost Questionnaires	Percentage
43	43	100%	31	72.1%	12	27.9%
Valid Questionnaires						Percentage %
31						72.1%

Source: Prepared by the researchers.

3.2 Statistical Methods Used

The study relied on the Statistical Package for the Social Sciences (SPSS) version 20 for data analysis, to test hypotheses and analyze correlational and influential relationships between variables. Descriptive statistical methods were also used, such as arithmetic means and standard deviations, to measure the sample members' attitudes towards the dimensions of intellectual capital and competitive performance. The validity and reliability of the measurement tool were verified by calculating the internal consistency coefficient

(Cronbach's alpha), which showed an acceptable level of reliability. To complete the analysis, multiple regression analysis was used to measure the impact of intellectual capital dimensions on the institution's competitive performance.

3.3. Validity and Reliability of the Measurement Instrument :

The reliability of the study instrument was assessed by calculating Cronbach's alpha coefficient to measure the level of internal consistency among the items of each questionnaire dimension. The results revealed the following:

Table (2): Cronbach's Alpha Coefficients for the Questionnaire Dimensions

Dimensions and Components	Cronbach's Alpha Coefficient
Intellectual Capital	0.868
Competitive Performance	0.880
Overall Coefficient	0.926

Source: Prepared by the researchers based on SPSS 20 outputs.

The results shown in the table above indicate that all coefficient values exceeded the acceptable minimum threshold (0.70). The intellectual capital dimension scored (0.868), while the competitive performance coefficient reached (0.880). The overall instrument coefficient achieved (0.926), confirming high internal consistency and demonstrating its reliability in measurement and analysis.

3.4. Analysis of Study Results:

3.4.1. Analyzing the personal and professional characteristics of the study sample

The personal and functional characteristics of the study sample can be summarized in the following table:

Table (3): Characteristics of the Study Sample

Variables	Categories	Frequencies	Percentages
Gender	Male	21	65.6%
	Female	11	34.4%
Age	Less than 30 years	7	21.9%
	30-40 years	14	43.8%
	40-50 years	5	15.6%
	More than 50 years	6	18.8%
Educational Qualification	Higher Technician	14	43.8%
	Bachelor's	4	12.5%
	Master's	14	43.8%
Job Field	Lower Management	5	15.6%
	Middle Management	13	40.6%
	Top Management	14	43.8%
Years of Experience	Less than 5 years	7	21.9%
	5 to less than 10 years	11	34.3%
	10-15 years	2	6.3%
	More than 15 years	12	37.5%

Source: Prepared by the researchers based on SPSS 20 outputs

Analysis of the data presented in the table above shows that the study sample is characterized by male dominance, representing (65.6%), compared to (34.4%) for females. The results also show that the most represented age group is (30-40 years), constituting (43.8%), indicating a youthful character of the sample. In terms of education, the results

showed that the majority of participants hold high qualifications, with the percentage of Master's degree holders and higher technical graduates being equal, each reaching (43.8%). In terms of functional distribution, the highest percentages were concentrated in the top management (43.8%) and middle management (40.6%) categories, reflecting the nature of leadership and supervisory responsibilities undertaken by the sample members. Regarding practical experience, the category with more than 15 years of experience recorded the highest percentage (37.5%), followed by the category of 5 to 10 years (34.3%), giving the sample the advantage of relying on experienced individuals. Based on these demographic and professional characteristics, it can be concluded that the study sample enjoys an advanced educational and professional level, which enhances the credibility of their responses and supports the reliability of the results extracted from the data.

3.4.2.Arithmetic Means of the Study Variables

The following weighting table was adopted as a reference standard for analyzing the arithmetic means of both the first and second dimensions of the questionnaire.

Table (4): Shows Weighted Mean Values and Their Associated Levels

Response Degree	Weighted Mean	Level
Strongly Disagree	From 1.00 to 1.7	Very Low
Disagree	From 1.80 to 2.5	Low
Neutral	From 2.60 to 3.39	Medium
Agree	From 3.40 to 4.19	High
Strongly Agree	From 4.20 to 5	Very High

Source: Prepared by the researchers

3.4.3.Descriptive Analysis of Respondents' Opinions

3.4.3.1. Analysis of the Intellectual Capital Dimension

The table below shows the sample members' responses regarding the first dimension related to intellectual capital with its three components (human capital, structural capital, relational capital).

Table (5): Arithmetic Means and Standard Deviations for the Intellectual Capital Dimension

Item No	Mean	Standard Deviation	Trend	Item No	Mean	Standard Deviation	Trend
1	3,4688	1,1909	High	17	3,9063	1,0273	High
2	3,6250	1,3137	High	18	3,7188	1,0234	High
3	3,7500	1,0473	High	19	3,3750	1,2636	Medium
4	4,0938	0,9284	High	20	3,9375	1,1053	High
5	3,4688	1,2696	High	21	3,9063	1,0273	High
6	3,4375	1,1897	High	22	4,3750	0,8707	Very High
7	3,2188	1,1566	Medium	23	4,4375	0,7156	Very High
8	3,3438	1,2854	Medium	24	4,0313	1,1212	High
9	3,7188	1,1140	High	25	4,1563	1,1943	High
10	3,0938	1,0583	Medium	26	4,0938	0,9284	High
11	3,5000	1,1640	High	27	3,4375	1,1622	High
12	2,9688	1,0621	Medium	28	3,5938	1,0734	High
13	3,7188	1,0545	High	29	3,7500	0,9504	High
14	3,5313	1,1067	High	30	3,5938	1,2664	High
15	3,1875	1,2297	Medium	31	3,9688	0,9995	Medium
16	3,6875	1,3060	High	-	-	-	-
Weighted Mean					3.344	1.162	Medium

Source: Prepared by the researchers based on SPSS 20 outputs.

The results shown in the table above indicate that the arithmetic means of the questionnaire items mostly ranged at a high level, with the lowest mean being (2.9688) and the highest mean reaching (4.4375), with an overall weighted mean of (3.344) and a total standard deviation of (1.162), indicating moderate variation in the responses of the sample members. It was also evident that the vast majority of the items exhibited a high positive trend, while some items showed a medium level, reflecting a high degree of consensus regarding the study content with some relative differences in the intensity of this agreement.

3.4.3.2. Analysis of the Competitive Performance Dimension

The table below shows the sample members' responses regarding the second dimension related to competitive performance with its various aspects (excellence, flexibility, cost, creativity).

Table (6): Arithmetic Means and Standard Deviations for the Competitive Performance Dimension

Item No	Mean	Standard Deviation	Trend	Item No	Mean	Standard Deviation	Trend
1	3,9375	1,0140	High	12	4,0000	1,1640	High
2	3,5625	1,4797	High	13	3,8438	1,1390	High
3	3,1875	1,3781	Medium	14	3,8750	1,0080	High
4	3,7813	0,9413	High	15	3,7500	1,0160	High
5	3,5938	1,0429	High	16	4,0313	0,9667	High
6	3,6563	1,0659	High	17	3,6875	0,9980	High
7	3,7188	1,1977	High	18	3,9063	0,8930	High
8	3,6875	1,0298	High	19	4,0000	1,0160	High
9	4,0000	1,0473	High	20	3,8750	1,1570	High
10	3,8125	1,3060	High	21	4,0000	0,8032	High
11	3,6875	1,0906	High	22	3,5625	1,0453	High
Weighted Mean					3.770	1.118	High

Through the analysis of the data presented in the table above, it was found that the response means ranged between 3.18 and 4.03, indicating a clear positive trend among the sample members, as all mean values exceeded the neutral limit (3). The standard deviations ranging between 0.80 and 1.47 also indicate an acceptable degree of symmetry in the respondents' responses, reflecting noticeable homogeneity in their opinions. Accordingly, it can be concluded that the sample's attitudes were positive and high for the most part, which shows general agreement regarding the study dimensions presented.

4. Analysis and Discussion of Study Hypotheses

4.1. Presentation and Analysis of the Study Model:

This study relied on a multiple regression model using the Ordinary Least Squares method to examine the relationship between the dimensions of the first axis (Human Capital (X1), Structural Capital (X2), and Customer Relational Capital (X3)) and the second axis, Competitive Performance, as the dependent variable (Y). Below are the results of applying the multiple regression model between the dimensions of the first and second axes of the study.

Table (7): Results of the Multiple Regression Model for Study Variables

Tolerance	VIF	Sig	t-statistic	Coefficients	Variables
-	-	0.37	0.911	0.496	(Constant)
0.553	1.807	0	3.254	0.563	Human Capital
0.63	1.588	0	3.368	0.448	Structural Capital
0.744	1.345	0.011	2.707	0.371	Relational Capital with Customers
0	F Sig		12.45	F-statistic	
0.57	R Square		0.75	R	
2.21				Durbin-Watson	
Estimated Equation					
y=0.49+0.56X1-0.44X2+0.37X3					

Source: Prepared by the researchers based on SPSS 20 outputs

The results in the table above indicate that the model possesses acceptable explanatory power. The multiple correlation coefficient (R) reached a value of (0.75), reflecting a strong positive linear relationship between the set of independent variables and the dependent variable.

On the other hand, statistical validity tests yielded reassuring results. The Durbin-Watson test value of (2.21) indicated the absence of autocorrelation among the residual values at the required significance level, thereby enhancing the reliability of the estimates. Furthermore, the relatively low Variance Inflation Factor (VIF) values confirmed the absence of a serious multicollinearity problem among the explanatory variables.

At the level of the overall statistical significance of the model, the Analysis of Variance (ANOVA) showed that the calculated F-statistic value of (12.45) was statistically significant at the ($\alpha \leq 0.05$) level. This confirms the overall statistical significance of the model and indicates that the independent variables, collectively, contribute meaningfully to explaining the variance in the dependent variable.

Moreover, the results of estimating the regression coefficients showed the statistical significance of a number of those coefficients at the (0.05) significance level. This confirms the significant impact of the relevant variables in predicting the values of the dependent variable.

Overall, these collective results confirm the validity and statistical adequacy of the proposed model, as well as its ability to explain the relationships under study. This is evidenced by a strong correlation, acceptable explanatory power, and consistent statistical significance for both the overall model and a subset of its variables.

4.2. Discussion and Analysis of Study Hypotheses

Following the verification of the statistical and econometric efficiency of the estimated model, its results will be adopted to discuss the assumptions proposed in the study's introduction.

4.2.1 Discussion of the First Main Hypothesis

The first null hypothesis states the following:

H₁⁰: There is no statistically significant effect at the level ($\alpha \leq 0.05$) of human capital on competitive performance in the economic institutions of Adrar Province.

Based on the model estimation results, which clarified that the parameter associated with the independent variable (Human Capital, X_1) is statistically significant at a level less than (0.05) and its sign is positive, in addition to the overall statistical validity of the estimated model, it can be concluded that the first null hypothesis has been **rejected** in favor of the alternative hypothesis. Thus, it is evident that there is a **positive and statistically significant effect** of human capital on improving the competitive performance of the economic institutions under study.

This result is interpreted by the fact that human capital represents a fundamental pillar in achieving competitive advantage. Investment in developing human knowledge, capabilities, and skills—through continuous education and training programs—constitutes a direct and influential factor in raising overall organizational efficiency and enhancing the institution's competitiveness.

4.2.2. Discussion of the Second Main Hypothesis

The second null hypothesis states the following:

H₂⁰: There is no statistically significant effect at the level ($\alpha \leq 0.05$) of structural capital on competitive performance in the economic institutions of Adrar Province.

The estimation results showed that the parameter for the variable (Structural Capital, X_2) is statistically significant at the (0.05) level and carries a positive sign, which leads to the **rejection** of the second null hypothesis in favor of the alternative hypothesis. Consequently, it can be stated that structural capital has a **positive and statistically significant effect** on enhancing the competitive performance of the institutions under study.

This finding highlights the vital role of structural capital as one of the pillars of intellectual capital. It encompasses organizational rules, internal systems, databases, and intellectual property rights. These institutional structures provide a supportive framework for organizing and efficiently utilizing knowledge, contributing to raising the level of operational effectiveness, strengthening innovation capacity, and delivering more competitive products and services. Therefore, it is confirmed that enhancing structural capital represents a strategic factor in improving the competitive performance of economic institutions in Adrar Province.

4.2.3. Discussion of the Third Hypothesis

The third null hypothesis states the following:

H₃⁰: There is no statistically significant effect at the level ($\alpha \leq 0.05$) of customer relational capital on competitive performance in the economic institutions of Adrar Province.

The econometric analysis results clarified that the coefficient of the variable associated with (Customer Relational Capital, X_3) is statistically significant at the (0.05) level and carries a positive sign. This necessitates the **rejection** of the third null hypothesis and the acceptance of the alternative hypothesis. Accordingly, it can be confirmed that there is a **positive and statistically significant effect** of relational capital on enhancing the competitive performance of the institutions subject to the study.

This result indicates the fundamental importance of relational capital as a pivotal component of intellectual capital. Building a robust network of relationships with customers, maintaining their loyalty, and raising their satisfaction levels forms the

foundation for supporting an institution's competitive capability. This dimension also contributes to expanding market share, generating opportunities for innovation, and enhancing organizational learning processes, which is directly reflected in improving the institution's financial and competitive performance.

5. CONCLUSION

This study yielded a set of results that can be summarized as follows: it demonstrated that intellectual capital, with its three components (human, structural, and relational), is a central driver for enhancing the competitive performance of economic institutions in the state of Adrar. The statistical analyses revealed a statistically significant effect for each dimension individually; human capital proved its positive influence on developing organizational capabilities, while structural capital contributed to raising operational efficiency, and relational capital effectively contributed to enhancing customer loyalty and expanding market share.

The insights derived from these results represent a dual contribution:

- **From a theoretical perspective:** This study contributes to enriching the literature related to intellectual capital and competitive performance by applying the theoretical framework of their relationship and testing it in a new context: the Algerian business environment (Adrar state). Thus, the study provides an empirical verification of existing theoretical models in a different context, contributing to a deeper theoretical understanding of the subject.
- **From an applied perspective:** The study provides tangible evidence that decision-makers in Algerian economic institutions can rely on to justify investment in intellectual capital and develop concrete strategies for its development, based on measuring its direct impact on the competitive performance indicators that were observed.

Based on these results, the study presents a set of recommendations directed at Algerian economic institutions, the most important of which are:

- Strengthening their investments in human capital by developing sustainable training programs focused on building leadership and creative skills;
- Enhancing structural capital by adopting knowledge management systems and updating technological infrastructure that supports knowledge storage and sharing;
- Developing relational capital by building strategic partnerships with customers and suppliers and strengthening their corporate image in the market.

As a proposal for future research, the study calls for generalizing the findings by expanding the scope of research to include additional sectors and other states, conducting comparative studies between the public and private sectors, and also suggests adopting qualitative research methodologies for a deeper understanding of the underlying mechanisms behind these relationships.

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6. Appendices

Appendix 01: Descriptive Statistics of the Items

Educational Qualification

Qualification	N	%
Higher National Diploma	14	43.8%
Bachelor's Degree	4	12.5%
Master's Degree	14	43.8%

Gender

	N	%
Male	21	65.6%
Female	11	34.4%

Years of Experience

Experience Range	N	%
Less than 5 years	7	21.9%
5 to less than 10 years	11	34.4%
10 – 15 years	2	6.3%
More than 15 years	12	37.5%

Age

Age Group	N	%
Under 30 years	7	21.9%
30 – 40 years	14	43.8%
40 – 50 years	5	15.6%
Over 50 years	6	18.8%

Appendix 02: Cronbach's

Alpha Test

Reliability Statistics

Cronbach's Alpha	N of Items
.926	53

Reliability Statistics

Cronbach's Alpha	N of Items
.880	22

Reliability Statistics

Cronbach's Alpha	N of Items
.868	31

Appendix 03: Multiple Regression Model

Notes

Output Created	07-MAY-2024 22:47:04
Comments	

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.496	.544		.911	.370		
Human Capital	.563	.173	.253	3.254	.000	.553	1.807
Structural Capital	.448	.133	.292	3.368	.000	.630	1.588
Customer Relationship Capital	.371	.137	.388	2.707	.011	.744	1.345

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT y /METHOD=ENTER x1 x2 x3 /SCATTERPLOT=(y ,*ZRESID) /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID).
Resources	Processor Time	00:00:01.73
	Elapsed Time	00:00:00.77
	Memory Required	5872 bytes
	Additional Memory Required for Residual Plots	864 bytes

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics				Durbin-Watson
						F Change	df1	df2	Sig. F Change	
1	.756 ^a	.572	.526	.40132	.572	12.459	3	28	.000	2.215

a. Predictors: (Constant),

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.6601	4.9041	3.7798	.44067	32
Residual	-.70667	1.19634	.00000	.38140	32
Std. Predicted Value	-2.541	2.551	.000	1.000	32
Std. Residual	-1.761	2.981	.000	.950	32

a. Dependent Variable: القدرة التنافسية

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Human Capital	Structural Capital	Customer Relationship Capital
1	1	3.959	1.000	.00	.00	.00	.00
	2	.019	14.381	.15	.02	.60	.22
	3	.012	18.467	.84	.11	.02	.46
	4	.010	20.036	.01	.87	.38	.32

a. Dependent Variable:

pendix 4: The Survey Questionnaire

Survey Questionnaire

Dear Participants,

Welcome, and thank you for your willingness to contribute to this survey. This questionnaire serves as a primary data collection instrument for a scientific research study entitled: **"The Impact of Intellectual Capital on Enhancing the Competitive Performance of Algerian Economic Institutions: An Applied Study on a Sample of Institutions in the Adrar Province."**

This scientific article aims to examine the relationship between the components of intellectual capital (human, structural, and relational) and the level of performance and competitive capacity of institutions operating within the Algerian economic context.

Your accurate and complete responses will form a valuable analytical foundation for the conclusions of this study. We assure you that all data you provide will be treated with strict confidentiality and will be used solely for the research and statistical purposes outlined in this article. The anonymity of all participants will be fully preserved in any resulting publication.

We highly appreciate your valuable time and cooperation in advancing scientific research. Sincerely,

Part One: Personal Data

This section aims to identify some of the social and professional characteristics of the institution's employees for the purpose of analyzing the results. Therefore, we kindly ask you to answer the following questions by placing a check mark (✓) or an (x) in the appropriate box.

Section Two: Competitive Capability

The following is a set of statements designed to measure the organization's **competitive capability**. Please indicate your level of agreement with each statement by placing an (X) in the appropriate box.

No	Dimensions of Intellectual Capital & Measurement Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Distinction						
Distinction						
1	The organization strongly adopts quality specifications and standards in all its products and services.					
2	The organization dedicates a special unit for communicating with customers to understand their opinions regarding the quality of products and services.					
3	There are few customer complaints regarding the quality of the organization's products and services.					
4	The organization offers its products at competitive prices.					
5	The organization offers products and services with a distinctive quality that sets it apart from competing organizations.					
6	The organization offers products and services with a distinctive quality that sets it apart from competing organizations.					
7	The organization offers products and services with a distinctive quality that sets it apart from competing organizations.					
8	The organization's business results improve from year to year.					
9	The organization's business results improve from year to year.					
Flexibility						
1	The organization executes its operations with greater speed and precision than its competitors.					
2	The organization demonstrates adaptability to competitive pressures.					
3	The firm systematically enhances its managerial methodologies and service offerings on an annual basis.					
4	The organization's strategic plans and policies exhibit flexibility to align goal attainment with prospective environmental contingencies.					
5	The administrative leadership endeavors to comprehend market dynamics through the formulation of adaptive plans for plausible future scenarios.					
Cost						
1	The organization sustains a competitive edge through superior cost efficiency in its production operations relative to industry counterparts					
2	The institution demonstrates a pronounced advantage in minimizing administrative overhead expenditures compared to sector competitors.					
3	The enterprise exhibits optimized cost structures in its logistical functions, yielding a discernible competitive cost position against market rivals.					
Creativity						
1	The organization proactively introduces novel products to address evolving market exigencies.					
2	The organization's human capital possesses demonstrable capacity for generative ideation.					
3	The institution systematically assimilates and pilots innovative propositions from personnel to mitigate operational impediments.					
4	The enterprise pursues iterative enhancements to its operational processes, product portfolios, and service delivery mechanisms.					
5	The organization allocates both tangible and intangible resources to cultivate an innovation-conducive ecosystem for its workforce					