American Journal of Industrial and Business Management, 2024, 14, 969-991
https://www.scirp.org/journal/ajibm
ISSN Online: 2164-5175
ISSN Print: 2164-5167

Economic Intelligence and Competitiveness of Tunisian Companies

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How to cite this paper: Chrifa, B., & Younes, B. (2024). Economic Intelligence and Competitiveness of Tunisian Companies. *American Journal of Industrial and Business Management, 14,* 969-991.
https://doi.org/10.4236/ajibm.2024.147050

Received: April 29, 2024
Accepted: July 28, 2024
Published: July 31, 2024

Abstract

In this article, the significance of economic intelligence in bolstering the competitiveness and performance of Tunisian companies is emphasized. Through an in-depth analysis utilizing SPSS software, incorporating 35 variables via factor analysis, and subsequent linear regression studies involving 7 factors, the interconnections among these elements are explored. The outcomes underscore the substantial impact of economic intelligence on companies' competitiveness and performance. It concludes by advocating for the integration of economic intelligence as a fundamental managerial practice among Tunisian companies to enhance their competitive edge in the global market, underscoring its strategic relevance amidst the dynamic business landscape. The findings underscore a strong positive correlation between economic intelligence and business competitiveness in Tunisia, suggesting that by prioritizing economic intelligence, Tunisia can enact strategic changes aligned with its objectives, leading to favorable outcomes.

Keywords

Economic Intelligence, Competitiveness, Performance, Tunisian Companies, Factor Analysis, Linear Regression

1. Introduction

Business Intelligence (EI) has become a key element of modern business strategy. In a highly competitive and volatile business environment, companies must constantly monitor and analyze their environment to remain competitive. IE addresses this need by providing strategic insights that predict market trends, assess risks and seize opportunities. According to Besson & Possin (2001), EI includes the collection, analysis and strategic use of information to make informed decisions and improve organizational performance.

To understand the current importance of EI, it is necessary to trace its historical evolution. Juhari & Stephens (2006) explore the origins of business intelligence and its development over time, highlighting how the concept has evolved to meet the growing information management needs of businesses. Harbulot & Baumard (1997) complete this perspective by proposing a historical analysis that shows how EI practices have been affected by economic and technological changes. The relationship between EI, competitiveness and business performance is complex and multidimensional. Business Intelligence is not only an information management tool, but also a strategic lever to improve performance and strengthen the competitiveness of companies. According to Chafia (2020), EI plays an important role in improving business performance in Algeria by providing key information to make more informed decisions. Similarly, the work of Yasmina & Zouaoui (2020) shows that EI practices can have a positive impact on the competitiveness of Tunisian companies in international markets.

This study aims to review existing research on the impact of competitive intelligence on competitiveness and business performance. It will draw on academic work and case studies to highlight how EI contributes to business strategy and performance management. We will analyze the contributions of several authors, including Revel (2006), Fatma, Ibticem, & Henri (2019), to give an overview of the practice and impact of EI in different contexts.

1.1. Economic Intelligence and Competitiveness

Economic intelligence (EI) plays a crucial role in improving the competitiveness of companies by providing them with strategic and operational information. This dimension of EI is well detailed by Revel (2006) in "Economic Intelligence and Competitive Governance". Revel explains that EI allows companies to better understand their competitive environment, anticipate market changes and adapt their strategies accordingly. The ability to analyze market trends and competitor movements gives companies a significant competitive advantage.

The methods and tools used in economic intelligence are essential to enhance competitiveness. Kislin (2007) explores the techniques of information collection, analysis and processing that are crucial to transform data into useful intelligence. The effective use of these tools allows companies to develop more informed strategies adapted to market dynamics.

Fatma, Ibticem, & Henri (2019) show how the application of EI improves the competitiveness of SMEs in Tunisia. They note that SMEs that adopt EI practices benefit from better information management and responsiveness to market changes. Mansouri (2013) examines how EI contributes to the competitiveness of Moroccan companies. The study reveals that Moroccan companies investing in EI are better equipped to compete internationally and optimize their internal processes.

Tarek & Sami (2014) demonstrate that EI helps Tunisian companies improve their international competitiveness by providing strategic information on foreign markets and helping them adapt their strategies to global competition.

1.2. Business Intelligence and Business Performance

Economic intelligence is often seen as a crucial strategic lever to improve business performance. Indeed, it allows collecting, analyze and use relevant information to optimize business decisions and strategies. Business performance can be accessed through various indicators, such as profitability, operational efficiency and customer satisfaction. Chafia (2020) explores how economic intelligence impacts business performance in Algeria. It shows that companies that integrate business intelligence practices succeed in improving the quality of their strategic decisions. Access to accurate and up-to-date information allows decision-makers to better anticipate market trends and adapt their strategies accordingly, leading to better overall performance.

Yasmina & Zouaoui (2020) also stress that economic intelligence helps Tunisian companies identify market opportunities and avoid potential risks. This ability to proactively anticipate and react improves companies' financial and operational results.

Business intelligence plays a key role in optimizing business processes. Dhaoui (2008) analyses the success criteria of economic intelligence systems for better strategic management. It shows that companies using effective business intelligence and business intelligence systems can improve their business processes, reduce costs and increase efficiency. Kislin (2007) highlights how effective information management can reduce inefficiencies and improve productivity. Companies that use business intelligence tools to monitor and analyze the performance of their internal processes achieve more positive performance results.

Audigier et al. (2003) describe how economic intelligence can be a new management tool that directly influences business profitability. By providing relevant information for financial and strategic decision-making, economic intelligence helps companies maximize profits and support growth. Ursăcescu & Cioc (2012) show that companies that invest in economic intelligence practices tend to show higher growth rates and better profitability, through a more informed strategy and better aligned with market trends. The work of Tarek & Sami (2014) on Tunisian firms can serve as a concrete example of how economic intelligence has been applied to improve performance. Similarly, the analysis of Larivet & Brouard (2007) on SME strategies and the practice of economic intelligence can provide practical examples of how SMEs use these tools to improve their performance.

Economic intelligence is an essential strategic lever to strengthen the competitiveness of companies. By providing key information, it improves decision-making processes and helps companies anticipate market developments and react proactively. Case studies and empirical research show that companies that adopt business intelligence practices are better prepared to compete and seize opportunities in international markets. The effective integration of these practices leads to better decision-making, optimized operations, increased profitability and sustained growth. As a result, companies that make full use of economic intelligence tools are in a position to thrive in an increasingly complex and competitive business environment.

2. Research Methodology

Research on business intelligence practices and competitiveness as well as the performance of Tunisian companies adopts an approach combining descriptive and analytical methods. The descriptive method characterizes the phenomenon of economic intelligence, while the analytical method breaks it down. The study targets public and private companies in Tunisia, with an emphasis on those unfamiliar with business intelligence. A representative sample of 70 companies from various sectors was selected, with a structured four-part questionnaire as the main data collection tool. The questionnaire application procedures were rigorous, with manual and email distribution to a sample of 96 companies, and a significant response rate of 73.68%. Data collection spanned two months and used a variety of methods, including on-site responses, email, and Google Forms. Despite challenges encountered, such as difficulty finding companies knowledgeable about competitive intelligence and reluctance to cooperate, the methodology seems suited to the study's objective, which is to explore the impact of competitive intelligence economic on the competitiveness of Tunisian companies.

3. Results and Discussion

In this article, we examined 35 variables detailed in Appendix A in four key areas of the company. We explored each area independently before synthesizing the results. The first part focuses on two key points: company presentation and general information. The second part deals with economic intelligence. The third part discusses the competitiveness of the company, while the last part examines its overall performance.

3.1. Company Presentation and General Information

In the business ecosystem, as shown in **Figure 1**, a diversity of ages is emerging,

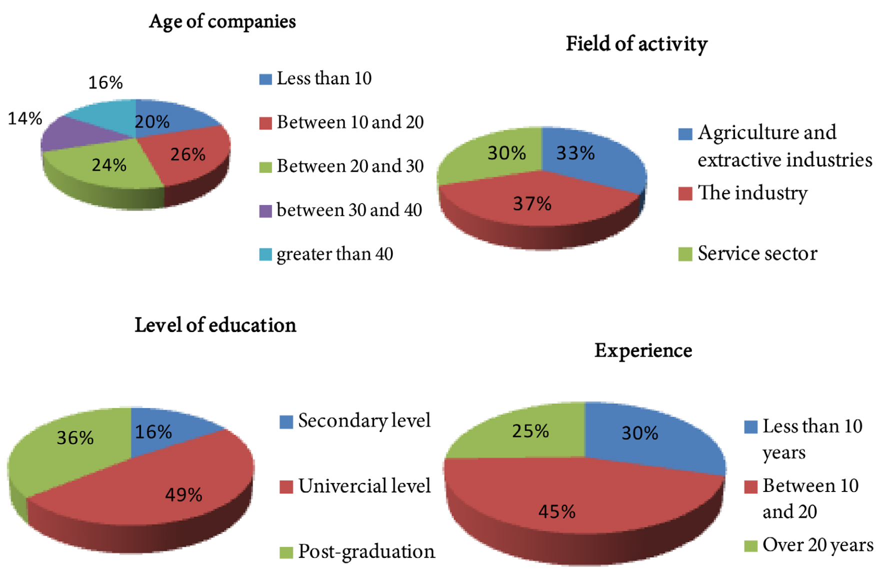

Figure 1. Company presentation and general information.

with a notable concentration of respondents in the 20 to 30 year old bracket, closely followed by those aged fewer than 10. The most represented sectors of activity are industry, agriculture and services, reflecting a varied economy.

The educational levels of business leaders highlight a predominance of university graduates, while professional experience shows a balanced distribution between less than 10 years, 10 to 20 years and more than 20 years of experience. In short, the entrepreneurial landscape is characterized by the maturity of companies, the high academic qualification of business leaders and their significant experience, particularly in the niche of 10 to 20 years of experience, as in the Figure 1.

3.2. Factor Analysis of Economic Intelligence, Competitiveness and Business Performance

3.2.1. Factor Analysis of Business Intelligence

This part presents a factor analysis of business intelligence, starting with descriptive statistics on 23 variables evaluated with 70 companies (Table 1). The series mean varies between 2.74 and 3.41, with a standard deviation of 0.94 to 2.68.

Table 1. Descriptive statistics.

Variables	Descriptive statistics		
	Mean	Standard Deviation	Number of Analyses
S.C.T	3.10	1.024	70
S.C.C	3.11	1.001	70
S.C.Com	2.90	1.241	70
S.E.T	3.41	1.056	70
V.N.C	3.06	1.153	70
A.N.C	3.06	1.166	70
P.T.N.C	3.03	2.681	70
T.M.N.C	3.04	1.173	70
Appl.N.C	2.89	1.110	70
I.V.N	3.14	0.952	70
M.M.P	2.87	1.284	70
C.S.M.S	2.77	1.553	70
S.C.S	2.77	1.182	70
P.P.C	3.14	1.094	70
G.N.O	3.24	1.083	70
C.I	3.06	0.946	70
C.R.J.C	3.24	1.197	70
P.R.A.I	3.21	1.115	70
A.I.I	2.79	1.226	70
A.N.O	2.97	1.239	70
E.D.S	3.03	1.116	70
E.CT	2.74	1.138	70
F.P.M.F	3.20	1.124	70

As shown in Table 1, the SCT variable has the highest mean (3.10). The E.CT variable has the lowest mean (2.74). The variable PTNC exhibits the highest standard deviation at 2.68, whereas the CI variable demonstrates the lowest standard deviation at 0.94.

First, we must ensure that the items are correlated with each other. To do this, we look at the correlation matrix (Table 2). In this detail of the matrix, we can observe that all variables appear at least slightly correlated. Some correlations are stronger than others.

All illustrated in Table 1, the variables SCT and SCC (0.795) have a strong positive correlation, indicating a common trend. The variables SCCom and SET (0.811) have a strong positive correlation, suggesting a close link. The two variables VN.C and Appl. NC (0.766) have a strong positive correlation, indicating an important relationship. The two variables MMP and CSMS (0.917) have a very strong correlation, suggesting a quasi-linear dependence.

The variables SCT, SCC, SCCom, SET, VN.C and AN.C formed a group with high positive correlations between them. The variables PTNC, TMNC, Appl.NC, IV.P and MMP formed another group with high positive correlations between them. The variables CSMS, SCS, PPC, G.NO, CI, CRJC, P.RAI and All formed a third group with high positive correlations between them. The PTNC variable and the other variables: generally weak correlations, indicating less pronounced links.

The KMO index, as indicated in Table 3, measuring sampling accuracy, is 0.864 in the image. This value is considered excellent, indicating that the data is very suitable for factor analysis. Bartlett's test, testing the sphericity of the correlation matrix, is significant with a p-value < 0.001. This means that the variables are highly correlated and a factor analysis is warranted.

Table 2. Correlation matrix.

		S.C.T	S.C.C	S.C.Com	S.E.T	V.N.C	A.N.C	P.T.N.C	T.M.N.C	Appl.N.C	I.V.P	M.M.P
Correlation	S.C.T	1.000	0.795	0.773	0.725	0.716	0.760	0.147	0.805	0.671	0.664	0.761
	S.C.C	0.795	1.000	0.677	0.709	0.632	0.777	0.129	0.786	0.688	0.662	0.758
	S.C.Com	0.773	0.677	1.000	0.811	0.885	0.714	0.257	0.778	0.843	0.706	0.886
	S.E.T	0.725	0.709	0.811	1.000	0.836	0.792	0.289	0.745	0.831	0.760	0.825
	V.N.C	0.716	0.632	0.885	0.836	1.000	0.695	0.288	0.776	0.766	0.735	0.819
	A.N.C	0.760	0.777	0.714	0.792	0.695	1.000	0.343	0.751	0.741	0.575	0.750
	P.T.N.C	0.147	0.129	0.257	0.289	0.288	0.343	1.000	0.258	0.267	0.201	0.241
	T.M.N.C	0.805	0.786	0.778	0.745	0.776	0.751	0.258	1.000	0.658	0.586	0.677
	Appl.N.C	0.671	0.688	0.843	0.831	0.766	0.741	0.267	0.658	1.000	0.610	0.793
	I.V.P	0.664	0.662	0.706	0.760	0.735	0.575	0.201	0.586	0.610	1.000	0.790
	M.M.P	0.761	0.758	0.886	0.825	0.819	0.750	0.241	0.677	0.793	0.790	1.000

Table 3. The KMO index and the Bartlett test.

The KMO index and the Bartlett test		
Precision measurement of Kaiser-Meyer-Olkin sampling		0.864
Bartlett Sphericity Test	Khi-two approximated	2618.004
	ddl	253
	Meaning of Bartlett	0.000

The high KMO index and the significance of the Bartlett test confirm that the data are well suited to factor analysis (Table 3). It is likely that factor analysis will make it possible to extract significant and explainable factors.

Table 4 presents the results of a principal component analysis (PCA) on 23 variables. The first row of table shows that the first component explains 73.09% of the total variance in the data. The second component explains 5.25% of the variance, the third 4.43%, and so on. The second column of Table 4 shows the cumulative percentage of variance explained by each component. As shown in Table 4, the first component explains 73.09% of the variance, while the first three components together explain 82.77% of the variance. The third column of table shows the Eigen-values of each component. The Eigen-value is a measure of the importance of the component. The first component has the highest Eigen-value, indicating that it is the most important. The last column of table shows the squares of the factors retained for each component. This information is useful for choosing the number of components to extract.

This table of total variance explained shows that the first component is very important, because it explains a large part of the total variance in the data. The first three components together explained more than 82% of the variance. This suggests that the first three components are sufficient to capture most of the information contained in the original 23 variables. This table shows that PCA is an effective technique for reducing the dimensionality of data while retaining a large part of the information. In this case, the first three components are sufficient to include most of the information contained in the 23 original variables.

The Eigen-value graph (Figure 2) allows you to visualize the distribution of Eigen-values of a covariance or correlation matrix. In this graph, we observe a significant drop in the Eigen-values after the third component. The first six components have Eigen-values greater than 1. This suggests that the first six components are important in explaining the variance of the data.

The "elbow" of the Figure 1 is located after the third component. This suggests that the first three components take up most of the information contained in the data. The following components can be useful for a more detailed analysis, but they explain less variance.

After retaining three factors, reveals the variables most associated with each factor. The first factor is defined by 17 variables, the second by 5 and the third by a single variable, as shown in Table 5.

Table 4. Total variance explained.

Component	Initial Eigen-values			Sum extraction of the squares of the selected factors		
	total	% of variance	% cumulative	total	% of variance	% cumulative
1	16.811	73.090	73.090	16.811	73.090	73.090
2	1.209	5.254	78.344	1.209	5.254	78.344
3	1.018	4.428	82.772	1.018	4.428	82.772
4	0.650	2.826	85.598			
5	0.603	2.621	88.219			
6	0.501	2.178	90.398			
7	0.405	1.762	92.160			
8	0.373	1.621	93.781			
9	0.237	1.030	94.811			
10	0.210	0.913	95.724			
11	0.186	0.809	96.533			
12	0.173	0.752	97.285			
13	0.159	0.693	97.978			
14	0.102	0.444	98.422			
15	0.085	0.372	98.794			
16	0.078	0.341	99.135			
17	0.061	0.264	99.399			
18	0.044	0.190	99.588			
19	0.031	0.136	99.724			
20	0.026	0.114	99.838			
21	0.019	0.083	99.920			
22	0.012	0.054	99.974			
23	0.006	0.026	100.000			

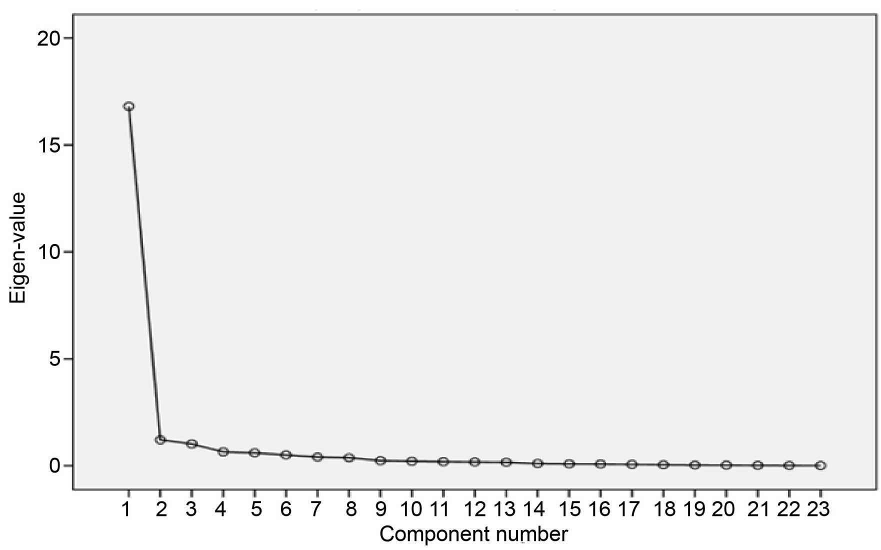

Figure 2. Eigen-value graph.

Table 5. Component matrix.

	Component		
	1	2	3
M.M.P	0.928	−0.149	
S.E.T	0.923	−0.060	0.063
C.S.M.S	0.921	−0.086	
S.C.Com	0.918	−0.079	
V.N.C	0.906	−0.086	
G.N.O	0.887	−0.066	0.095
F.P.M.F	0.883	−0.112	−0.056
P.R.A.I	0.880		
A.I.I	0.878	−0.068	0.093
S.C.S	0.870	−0.215	0.059
Appl.N.C	0.870	−0.136	
A.N.O	0.867	−0.351	
C.I	0.863	0.280	−0.057
E.D.S	0.861	−0.129	−0.153
A.N.C	0.859	0.284	0.089
P.P.C	0.853	−0.310	0.169
C.R.J.C	0.849	0.269	
S.C.T	0.446	0.566	−0.226
E.CT	0.346	0.419	0.056
T.M.N.C	0.438	0.477	−0.106
S.C.C	0.331	0.443	−0.242
I.V.P	0.310	0.453	−0.051
P.T.N.C	0.302	0.286	0.891

The variables that are highly contributory to the first factor are MMP, SET, CSMS, SCCom, VNC, GNO, FPMF, PRAI, AII, SCS, ApplNC, ANO, CI, ANC, PPC, EDS and CRJC. This component seems capable of capturing strategic dimensions that allow companies to quickly adapt to market changes, innovate, manage risks and ensure their security while remaining financially autonomous.

The variables that are highly contributory to the second factor are SCT, E.CT, T.M.N.C, SCC and IVP. This component appears to encompass the use of short-term debt to finance activities, identifying values to protect, adapting to new knowledge, monitoring technological developments, and monitoring the actions of competitors.

The only variable strongly contributing to the third factor is PTNC. This component appears to involve the sharing and transfer of new knowledge.

In conclusion, factor analysis of business intelligence offers rich perspectives on the strategic dynamics of the Tunisian companies studied. Descriptive statistics reveal significant means and standard deviations, illustrating the diversity of evaluations on 23 variables among 70 Tunisian companies. The correlation matrix highlights complex links between variables, forming distinct groups with more or less strong correlations. The KMO index and Bartlett's test confirm the relevance of the data for factor analysis, highlighting the robustness of the results obtained. The total variance explained reveals that the first three components capture a significant portion of the variance in the data, while the Eigen-value plot confirms this observation by identifying an inflection point after the third component. Finally, the component matrix makes it possible to identify the most contributing variables to each factor, thus offering valuable insights into the strategic, financial, and knowledge sharing dimensions in the context of the business intelligence of the Tunisian companies studied.

3.2.2. Factor Analysis of Business Competitiveness

We present the following results, where each observation represents a typical depiction of 8 variables. Descriptive statistics reveal that the series' average ranges from 3.57 to 3.80, with standard deviations between 1.02 and 1.21, as indicated in Table 6.

Table 6. Descriptive statistics.

Variables	Descriptive statistics		
	Mean	Standard Deviation	Number of Analyses
L.G.P	3.66	1.020	70
P.C.S	3.80	1.175	70
R.S.Q	3.76	1.209	70
P.F.D	3.73	1.215	70
O.P.C	3.70	1.086	70
R.M.P	3.67	1.046	70
R.P.P.P	3.71	1.051	70
A.P.D	3.57	1.044	70

Table 5 presents the descriptive statistics of 8 variables linked to the competitiveness of companies for a sample of 70 observations (Table 6). The mean of this series is between 3.57 and 3.80 and the standard deviation is from 1.02 to 1.21.

The correlation matrix (Table 7) also presents the statistical significance (one-sided) of the correlation coefficients. All values are less than 0.000, meaning the correlations are statistically significant at the 0.1% level.

This Table 7 of correlation matrix shows that LGP is highly correlated with all other variables, with correlation coefficients above 0.74. This suggests that LGP is an important factor influencing the other variables. PCS, RSQ, PFD and OPC

Table 7. Correlation matrix.

		L.G.P	P.C.S	R.S.Q	P.F.D	O.P.C	R.M.P	R.P.P.P	A.P.D
Correlation	L.G.P	1.000	0.837	0.813	0.801	0.836	0.858	0.745	0.800
	P.C.S	0.837	1.000	0.874	0.875	0.830	0.843	0.857	0.851
	R.S.Q	0.813	0.874	1.000	0.823	0.852	0.784	0.834	0.778
	P.F.D	0.801	0.875	0.823	1.000	0.808	0.830	0.812	0.799
	O.P.C	0.836	0.830	0.852	0.808	1.000	0.806	0.813	0.767
	R.M.P	0.858	0.843	0.784	0.830	0.806	1.000	0.770	0.786
	R.P.P.P	0.745	0.857	0.834	0.812	0.813	0.770	1.000	0.798
	A.P.D	0.800	0.851	0.778	0.799	0.767	0.798	0.798	1.000
Meaning (unilateral)	L.G.P		0.000	0.000	0.000	0.000	0.000	0.000	0.000
	P.C.S	0.000		0.000	0.000	0.000	0.000	0.000	0.000
	R.S.Q	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	P.F.D	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	O.P.C	0.000	0.000	0.000	0.000		0.000	0.000	0.000
	R.M.P	0.000	0.000	0.000	0.000	0.000		0.000	0.000
	R.P.P.P	0.000	0.000	0.000	0.000	0.000	0.000		0.000
	A.P.D	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

are also highly correlated with each other, with correlation coefficients between 0.8 and 0.9. This indicates that they share some common variance. RMP is less strongly correlated with the other variables, but still has significant correlations with LGP, PCS and OPC. APD is the variable least correlated with the others, with correlation coefficients below 0.8.

The KMO index is excellent, indicating that the data is very suitable for factor analysis. Bartlett's test of sphericity is significant, meaning that the variables are correlated and factor analysis is possible, as shown in Table 8. The results of the KMO index and Bartlett's test of sphericity indicate that the data are very suitable for factor analysis.

Table 8. The KMO index and the Bartlett test.

The KMO index and the Bartlett test		
Precision measurement of Kaiser-Meyer-Olkin sampling		0.949
Bartlett Sphericity Test	Khi-two approximated	689.904
	ddl	28
	Meaning of Bartlett	0.000

According to Table 9 of the total variance explained, the first component presents 84.012%. This means that 84.012% of the total variance of the 8 analysis

Table 9. Total variance explained.

Component	Initial Eigen-values			Sum extraction of the squares of the selected factors		
	total	% of variance	% cumulative	Total	% of variance	% cumulative
1	6.721	84.012	84.012	6.721	84.012	84.012
2	0.301	3.759	87.771			
3	0.260	3.248	91.020			
4	0.204	2.547	93.567			
5	0.165	2.062	95.629			
6	0.144	1.801	97.430			
7	0.113	1.407	98.837			
8	0.093	1.163	100.000			

variables in table can be explained by the first component. The other components explain smaller parts of the total variance. The second component explains 3.759% of the variance, the third component explains 3.248% of the variance, and so on.

The Eigen-value graph allows you to visualize the distribution of variance on the different variables. It is an important tool for determining the number of components to interpret and for understanding the structure of the data (Figure 3).

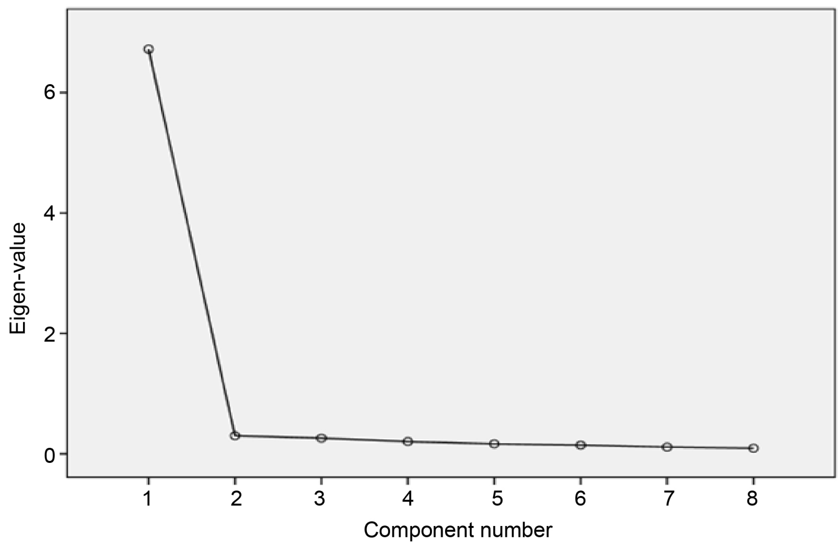

Figure 3. Eigen-value graph.

Figure 3 shows a rapid decrease in Eigen-values after the first variable. This first variable alone explains 61% of the total variance of the variables. This means that the first component is very important to capture most of the variations in the variables. The other variables explain much smaller parts of variance. The second variable explains 14% of the variance, the third 8%, and so on. The contribution of the following components quickly becomes negligible. As a general rule, we retain components whose Eigen-value is greater than 1. In this case, this corresponds to the first component. Since we retained only one factor (**Table 10**), we redid the analysis specifying that we wanted to keep this same number of factors in the extraction dialog box.

Table 10. Component matrix.

	Component
	1
P.C.S	0.951
R.S.Q	0.922
P.F.D	0.921
O.P.C	0.915
R.M.P	0.912
R.P.P.P	0.910
A.P.D	0.897
	0.880

In conclusion, the factor analysis of business competitiveness among Tunisian companies reveals significant results. Descriptive statistics highlight consistent means and standard deviations across a sample of 70 observations. The correlation matrix highlights strong links between certain variables, indicating important associations for understanding competitiveness. The KMO index and Bartlett's test of sphericity confirm the relevance of the data for factor analysis. The total variance explained reveals that the first component plays a crucial role, explaining a significant part of the total variance. The eigenvalue graph confirms this importance of the first component. Finally, the matrix of components confirms the relevance of retaining a single factor in the analysis, which underlines the importance of a key element in the competitiveness of the Tunisian companies studied.

3.2.3. Factor analysis of Business Performance

Table 11 of descriptive statistics provides a useful summary of the data for the 4 variables. It shows that the data is relatively evenly distributed around the mean and that the results are statistically significant.

As shown in **Table 11**, the mean is a measure of the central tendency of a data set. It is calculated by adding all the values and dividing by the number of values. In **Table 11**, the highest average is that of FCQC (3.76) and the lowest is that of RSAV (3.67). Standard deviation is a measure of the dispersion of data around the mean. It is calculated by taking the square root of the variance. In this table, the highest standard deviation is that of RNC (1.284) and the lowest is that of RSAV (1.126).

Table 11. Descriptive statistics.

Variables	Descriptive statistics		
	Mean	Standard Deviation	Number of Analyses
R.C.CA	3.73	1.203	70
R.S.AV	3.67	1.126	70
R.N.C	3.73	1.284	70
F.C.Q.C	3.76	1.256	70

This component matrix (Table 12) shows that all correlation coefficients are significant. The RCCA variable is strongly correlated with the other three variables. This means that these variables tend to increase or decrease together. The two variables RSAV and RNC are also strongly correlated with each other. The last variable FCQC is slightly less correlated with the other variables, but the correlation remains strong.

Table 12 shows that the four variables are strongly correlated with each other. This suggests that they may be influenced by common factors.

According to Table 13, the KMO index (0.851) is considered excellent, indicating that the data is very well suited for factor analysis. In other words, the variables are sufficiently correlated with each other. Bartlett's test of sphericity is significant, which means that the variables are correlated. Both the KMO index

Table 12. Correlation matrix.

		R.C.CA	R.S.AV	R.N.C	F.C.Q.C
Correlation	R.C.CA	1.000	0.843	0.805	0.781
	R.S.AV	0.843	1.000	0.769	0.773
	R.N.C	0.805	0.769	1.000	0.803
	F.C.Q.C	0.781	0.773	0.803	1.000
Meaning (unilateral)	R.C.CA		0.000	0.000	0.000
	R.S.AV	0.000		0.000	0.000
	R.N.C	0.000	0.000		0.000
	F.C.Q.C	0.000	0.000	0.000	

a. Sample.

Table 13. The KMO index and the Bartlett test

The KMO index and the Bartlett test		
Precision measurement of Kaiser-Meyer-Olkin sampling		0.851
Bartlett Sphericity Test	Khi-two approximated	242.011
	ddl	6
	Meaning of Bartlett	0.000

and Bartlett's test of sphericity indicate that the data are very well suited for factor analysis. It is therefore possible to continue the analysis and interpret the results of the extracts.

According to Table 14 of total variance explained, the first component explains 84.678% of the total variance, or 3.387. The second component explains 6.537% of the total variance, or 0.261. The third component explains 5.036% of the total variance, or 0.201. The fourth component explains 3.749% of the total variance, or 0.150 (Table 14).

As shown in Table 14, the total variance explained by the overall model is 96.251%. This means that the model is very accurate. The first component explains 84.678% of the total variance, which is the majority of the total variance explained by the overall model. The other components explain less variance.

According to Figure 4, the first variable explains a large part of the total variance of the variables. It therefore represents a linear combination of initial variables which capture a large part of the information contained in the dataset. The other variables explain a decreasing share of variance. As a general rule, we retain components whose Eigen-value is greater than 1. In this case, this corresponds to the first component.

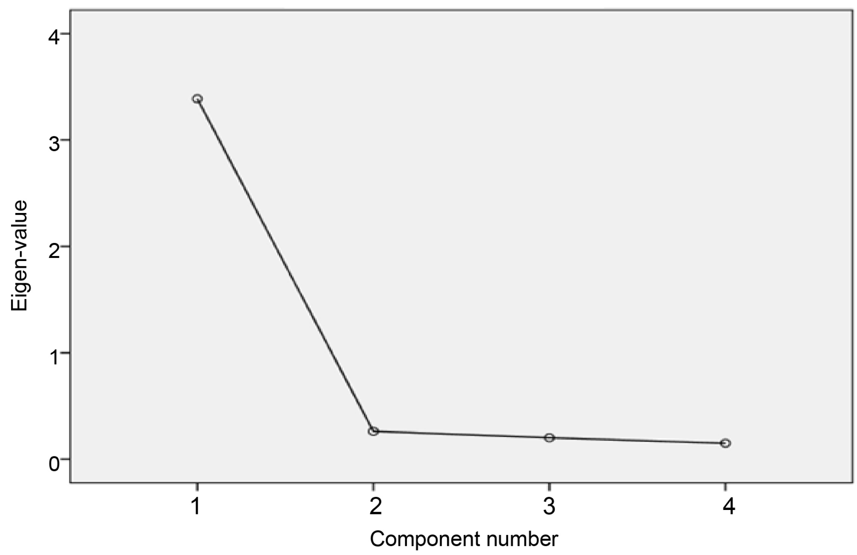

Figure 4. Eigen-value graph.

Table 14. Total variance explained.

Component	Initial Eigen-values			Sum extraction of the squares of the selected factors		
	total	% of variance	% cumulative	Total	% of variance	% cumulative
1	3.387	84.678	84.678	3.387	84.678	84.678
2	0.261	6.537	91.215			
3	0.201	5.036	96.251			
4	0.150	3.749	100.000			

The variable matrix presents the results of a principal component analysis on four variables (RCCA, RSAV, RNC and FCQC). The first variable (RCCA) explains 86.5% of the total variance in the data. This means that this variable is the most important in capturing the variation of the data. The second variable (RSAV) explains 84.6% of the total variance in the data. The third variable (RNC) explains 83.8% of the total variance in the data. The fourth variable (FCQC) explains 82.4% of the total variance in the data. The cumulative variance of the first component is 86.5%. This means that the first component alone explains 86.5% of the total variance in the data as indicated in Table 15.

Table 15. Component matrix.

	Component
	1
R.C.CA	0.932
R.S.AV	0.920
R.N.C	0.917
F.C.Q.C	0.911

Factor analysis of business performance, coupled with in-depth descriptive statistics, reveals significant insights from the data examined among Tunisian companies. Measures of central tendency and dispersion provide a clear overview of the distribution of the data, while the correlation between variables suggests meaningful connections between them. The KMO index and Bartlett's test of sphericity confirm the suitability of the data for factor analysis. The total variance explained reveals that the model is highly accurate, with a dominant component capturing a significant portion of the variance. Finally, the correlation matrix highlights the relative importance of each variable in the variation in the data, highlighting potential directions for further analyses. In summary, this methodical approach offers a holistic and robust understanding of the performance of the Tunisian companies studied.

3.3. Linear Regression of Factors

In the previous section, we looked at methods of measuring the relationship between variables through correlation. Now we will look at predicting one factor from others in the framework of linear regression. We will also discuss the modeling of this linear relationship to optimize the representation of the links between the factors. Our focus is on the linear regression of factors, with the objective of predicting the competitiveness and performance of companies based on business intelligence. These analyzes are based on a database containing five business intelligence indicators, as well as competitiveness and performance factors where business intelligence is considered as independent variables and competitiveness and business performance as dependent variables. Consequently, we carry out a linear regression to evaluate the relationship between business intelligence and competitiveness, as well as another for that between business intelligence and performance.

3.3.1. Linear Relationship between Business Intelligence and Business Competitiveness

This presented regression model is statistically significant, explaining a significant portion of the variance in the dependent variable, as indicated in Table 16 by a p-value of 0.000. The sum of squares, measuring the variation in the data, is divided into two main components: the sum of the regression squares (28.827) and the sum of the squares of the residuals (40.173). Degrees of freedom are used to assess the number of independent values in the data, with five degrees of freedom for regression and 64 for residuals, calculated from the total number of observations (69) minus the number of independent variables (5). The averages of the squares obtained by dividing the sums of the squares by the degrees of freedom make it possible to evaluate the average effect of competitive intelligence and the average unexplained variation in the competitiveness of companies. The F-value, which is the ratio between the mean of the regression squares and the mean of the residual squares, is 9.185 in this case, with a p-value of 0.000, which indicates significance (p-value = 0.000) and confirms the importance of the model in explaining the variance in business competitiveness (Table 16). In conclusion, the regression model is considered significant and accurate, demonstrating that competitive intelligence has a significant average effect on firm competitiveness, with little unexplained variation.

As shown in Table 17, the coefficient of determination R^2 of 0.418 reveals that 41.8% of the variation in business competitiveness is explained by business intelligence, while the adjusted R^2, slightly lower at 0.372, and suggests a model not excessively complex. The F value, at 0.79 with a p value less than 0.001, indicates

Table 16. Interpretation of the ANOVA table.

Model		ANOVA				
		Sum of squares	ddl	Mean square	D	Meaning
1	Regression	28.827	5	5.765	9.185	0.000
	Residue	40.173	64	0.628		
	Total	69.000	69			

Table 17. Interpretation of the model summary table.

Model	R	R-two	R-two adjusted	Standard error of estimate	Change in statistics					Durbin-Watson
					Variation of R-two	Variation of F	ddl1	ddl2	Meaning of variation of F	
1	0.646	0.418	0.372	0.79228204	0.418	9.185	5	64	0.000	1.435

statistical significance of the variation in firm competitiveness, while the Durbin-Watson test at 1.435 indicates the absence of autocorrelation in the model residuals, with a standard error of the estimate of 5 units.

The coefficient table provides the linear regression coefficients for five separate analyses, each predicting firm competitiveness under the term "REGR factor score 1 for Analysis X", with X ranging from 1 to 5 (**Table 18**). If all explanatory variables are zero, the expected competitiveness of firms is 0.035, indicated by the constant. For example, a coefficient of 0.453 for "REGR factor score 1 for Analysis 1" means that an increase of one unit in this variable is associated with an increase of 0.453 in the competitiveness of companies in Analysis 1, while maintaining keep the other variables constant. This pattern is also observed for the other explanatory variables. All coefficients of the explanatory variables are positive, indicating that in each analysis, an increase in any explanatory variable is associated with an increase in firm competitiveness. Additionally, all variables are statistically significant in predicting business competitiveness, as indicated by p-values equal to 0.000.

3.3.2. Linear Relationship between Business Intelligence and Business Performance

As indicated in **Table 19**, the business intelligence model is statistically significant ($p = 0.000$), indicating that it explains a significant portion of business performance. The impact of business intelligence on firm performance is also significant, highlighting its role in explaining the observed variation in firm performance. The coefficient of determination (R^2) is 0.315, which means that this model explains 31.5% of the variation in company performance. In summary, this business intelligence model is statistically significant and explains a significant portion of the variation in company performance.

Table 20 of model summary presents the results of a linear regression. The coefficient of determination (R^2) indicates that 31.2% of the variation in company performance is explained by business intelligence. The adjusted R^2, taking into account the number of explanatory variables and observations, is 0.258, slightly lower than R^2. The F statistic, evaluating the null hypothesis that

Table 18. Interpretation of the coefficient table.

Model		Non standardized coefficients		Standardized coefficients	t	Meaning
		A	Standard error	Beta		
1	(Consistent)	0.035	0.097		0.364	0.000
	REGR factor score 1 for analysis 1	0.453	0.363	0.557	3.250	0.000
	REGR factor score 1 for analysis 2	0.481	0.208	0.583	4.319	0.000
	REGR factor score 1 for analysis 3	0.083	0.081	0.149	6.030	0.000
	REGR factor score 1 for analysis 4	0.242	0.303	0.292	5.798	0.000
	REGR factor score 1 for analysis 5	0.345	0.394	0.415	3.877	0.000

Table 19. Interpretation of the ANOVA table.

Model		ANOVA				
		Sum of squares	ddl	Mean square	D	Meaning
1	Regression	21.528	5	4.306	5.805	0.000
	Residue	47.472	64	0.742		
	Total	69.000	69			

Table 20. Interpretation of the model summary table.

Model	R	R-two	R-two adjusted	Standard error of estimate	Change in statistics					Durbin-Watson
					Variation of R-two	Variation of F	ddl1	ddl2	Meaning of variation of F	
1	0.559	0.312	0.258	0.86124657	0.312	5.805	5	64	0.000	2.012

all regression coefficients are zero, shows a significant variation of 0.86 with a p-value less than 0.001, which allows rejecting the null hypothesis with a high degree of trust. The Durbin-Watson test for residual autocorrelation gives a statistic of 2.012, indicating that there is no residual autocorrelation, which is within the acceptable range (between 1.5 and 2.5) .

In conclusion, these results demonstrate that the statistical model is significant and explains a significant part of the variation in company performance.

Table 21 provides the linear regression coefficients for five separate analyses, each predicting firm performance under the term "REGR factor score 1 for Analysis X", with predictive are zero, the average of company performance is 0.825. The coefficients from analyzes 1 to 5 reveal that for each unit increase in factor score, firm performance increases on average by 0.445, 0.395, 0.127, 0.408, and 0.214 respectively, holding other variables constant. The standardized coefficients suggest that analysis 1 is the most influential predictor variable, followed by analyzes 4 and 2. All coefficients are statistically significant except that of analysis 3. In summary, all five predictor variables are significantly related to firm performance, with Analysis 1 as the most significant, followed by Analyzes 4 and 2. These results should be interpreted in the context of the study.

Linear regression analyses revealed that business intelligence plays a crucial role in the competitiveness and performance of Tunisian companies. The statistical models, significant with a p-value of 0.000, explain respectively 41.8% and 31.5% of the variation in competitiveness and business performance. In addition, the introduction of new independent variables strengthens the model's ability to explain this variation. It is notable that business intelligence has a significant effect on these two aspects. These analyses demonstrate that Analysis 1 is the most influential predictor variable on business performance, followed by Analysis 4 and 2. These results suggest that business intelligence can be leveraged to improve both the competitiveness and performance of Tunisian companies.

Table 21. Interpretation of the coefficient table.

Model		Non standardized coefficients		Standardized coefficients	t	Meaning
		A	Standard error	Beta		
1	(Consistent)	0.825	0.405		6.235	0.000
	REGR factor score 1 for analysis 1	0.445	0.394	0.546	3.128	0.000
	REGR factor score 1 for analysis 2	0.395	0.226	0.479	2.752	0.000
	REGR factor score 1 for analysis 3	0.127	0.088	0.227	3.439	0.000
	REGR factor score 1 for analysis 4	0.408	0.329	0.494	3.242	0.000
	REGR factor score 1 for analysis 5	0.214	0.428	0.257	2.499	0.000

4. Discussion

In a constantly changing economic context, Tunisian companies must constantly innovate to maintain their competitive advantage. Business intelligence is emerging as an essential strategic tool, offering significant benefits in information management and decision making. This discussion explores the results of factor analysis and linear regressions on the impact of EI on the competitiveness and performance of Tunisian companies, corroborating them with the work of various authors.

Economic intelligence focuses on three key aspects: surveillance, protection and influence. These elements are essential to navigate in a complex and dynamic environment. Besson & Possin (2001) stress that EI is a management practice aimed at providing decision-makers with relevant strategic information. Indeed, their definition of EI as a process of information collection, analysis and protection would corroborate how EI helps Tunisian companies manage information and protect themselves against competitive threats.

The results of your analysis show that EI has a significant impact on business competitiveness. Revel (2006) argues that EI enhances competitiveness by enabling companies to better understand their environment and make informed decisions. This observation is also corroborated by the research of Tarek & Sami (2014), which have found that economic intelligence improves the international competitiveness of Tunisian companies by providing them with strategic information to guide their actions.

In terms of business performance, your results indicate a significant contribution from EI. Chafia (2020) observed that EI plays a crucial role in improving performance by enabling more efficient information management and optimized decision-making. This statement is reinforced by the results of your study, which show a positive relationship between EI and the performance of Tunisian companies.

The analytical methods used, such as factor analysis, are essential to understand the structure of the data and the relationships between variables. Péguiron (2008) stresses the importance of the validation of analytical methods to guarantee the robustness of the results. Validity tests such as the KMO index and the Bartlett test, as well as Eigen-values and component matrix analysis, validate the application of analytical methods in your study.

We conclude that these results confirm the strategic importance of economic intelligence for Tunisian companies, both in terms of competitiveness and performance. Marcon & Moinet (2011) argue that EI is not just a set of tools, but an integrated management practice that helps solve decision-making problems and improve performance. As Rouach (1996) points out, technological intelligence and economic intelligence are crucial for survival and economic security in a globalized market.

The adoption of economic intelligence thus becomes a strategic necessity for companies seeking to prosper in the knowledge economy. This active management practice not only improves competitiveness but also lays the foundations for sustainable performance in a constantly changing economic environment.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Audigier, M. et al. (2003). *L'intelligence économique: Un nouvel outil de gestion* (p. 7). Editions Maxima.

Besson, B., & Possin, J.-C. (2001). *Du renseignement à l'intelligence économique* (p. 336). Editions Dunod.

Chafia, H. (2020). *Étude de l'impact de l'intelligence économique sur la performance et la compétitivité de l'entreprise en Algérie* (p. 255). Thèse de doctorat, Université Djillali Liabes Sidi BelAbbès.

Dhaoui, C. (2008). *Les critères de réussite d'un système d'intelligence économique pour un meilleur pilotage stratégique* (p. 242). Thèse de Doctorat, Université Nancy 2.

Fatma, T. C., Ibticem, B. Z., & Henri, D. (2019). Organismes publics et efficacité d'une démarche d'intelligence économique des PME tunisiennes. *Revue Internationale d'Intelligence Économique, 11,* 135-158.

Harbulot, C., & Baumard, P. (1997). Perspective historique de l'intelligence économique. *Revue Intelligence Economique, 17,* 50-64.

Juhari, A. S., & Stephens, D. (2006). Tracing the Origins of Competitive Intelligence Trough History. *Journal of Competitive Intelligence and Management, 3,* 61-82.

Kislin, P. (2007). *Modélisation du problème informationnel du veilleur dans la démarche d'intelligence économique* (p. 67). Thèse de Doctorat, Université Nancy.

Larivet, S., & Brouard, F. (2007). *Stratégies des PME et pratique de l'intelligence économique et de la veille stratégique* (p. 69). Académie de l'entreprenariat.

Mansouri, Z. (2013). Intelligence économique et compétitivité de l'entreprise marocaine: Quelle interaction? *Marché et Organisations, No. 18,* 109-130. https://doi.org/10.3917/maorg.018.0109

Marcon, C., & Moinet, N. (2011). *L'intelligence économique* (2nd éd., pp. 27-28). Dunod.

Péguiron, F. (2008). *L'intelligence économique au service des acteurs de l'université: La* *question du partage de l'information sur les campus* (p. 23). L'Harmattan.

Revel, C. (2006). *Intelligence Economique et gouvernance compétitive* (p. 94). La documentation française.

Rouach, D. (1996). *La veille technologique et l'intelligence économique* (p. 126). PUF.

Tarek, B. H., & Sami, A. (2014). Effects of Corporate Economic Intelligence on the International Competitiveness of Tunisian Firms. *Knowledge Horizons-Economics, 6,* 113.

Ursăcescu, M., & Cioc, M. (2012). The Economic Intelligence Practices and Their Impact on the Organization's Strategic Behavior. *Review of International Comparative Management, 13,* 211-223.

Yasmina, B., & Zouaoui, L. (2020). Strategic Scanning: A Leverage of Company Competitiveness. *Les Cahiers du MECAS, 16,* 72-82.

Appendix A: Definition of variables.

Domain	Measure	Variable	Definition
Business Intelligence	Strategic Intelligence Monitoring	S.C.T	Tracking Technological Changes
		S.C.C	Tracking Competitor Behavior
		S.C.Com	Tracking Commercial Changes
		S.E.T	Tracking Evolutions and Trends
	Information Absorption	V.N.C	Valorizing New Knowledge
		A.N.C	Assimilating New Knowledge
		P.T. N.C	Sharing and Transferring New Knowledge
		T.M.N.C	Modifying and Transforming New Knowledge
		Appl.N.C.C	Applying New Knowledge Appropriately
	Information Security	I.V.P	Identifying Values to Protect against any Threat
		M.M.P	Implementing Measures and Means to Protect
		C.S.M.S	Controlling and Regularly Monitoring Security Means
		S.C.S	Supporting Security Costs to mitigate risks
	Environmental Influence	P.P.C	Practicing a Communication Policy
		G.N.O	Generating New Opportunities
		C.I	Covering Information
		C.R.J.C	Changing Competitive Rules of the Game
	Decision Making	P.R.A.I	Taking Risks in Improving and Innovating your products
		A.I.I	Giving Importance to Research and Development Investments
		A.N.O	Pioneering in Acquiring New Opportunities
		E.D.S	Encouraging Dialogue with Subordinates
		E.CT	Using Short-Term Debt as a Financing Mode
		F.P.M.F	Using Equity Funds as a Financing Mode
Company Competitiveness	Product Competitiveness	L.G.P	Producing a Wide Range of Products
		P.C.S	Manufacturing Products According to Customer Specifications
		R.S.Q	Competing on Quality.
		P.F.D	Offering Reliable and Durable Products
		O.P.C	Providing Competitive Prices
	Organizational Competitiveness	R.M.P	Brand Reputation among the Public
		R.P.P.P	Elasticity to Carry out Advertising and Promotion Programs
		A.P.D	Adopting a Distribution Policy
Company Performance	R.C.CA		Achieving Revenue Growth
	R.S.AV		Claims with your After-Sales Service
	R.N.C		Retaining a Number of Clients
	F.C.Q.C		Ensuring Continuous Quality Training for your Skills