

Full length research paper

Impact of the governance system efficiency on the performance of the regional transport companies in Tunisia

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The aim of this paper is to analyze the relationship between the efficiency of governance structure and financial performance. An extensive literature focuses on the potential link between corporate governance and firm performance. Most studies are interested only in one aspect of governance, but fewer researches examine the potential link between overall corporate governance and firm performance. Based on a sample of 12 Tunisian Regional Transport Companies (RTC), over the period between 2000 and 2010, we tested the hypothesis according to which firms having the most efficient governance structures are the most efficient. We were able to show that the RTC governance structure is efficient at 71.69%. Hence, we could prove that there is an excessive governmental interference in the RTC through the negative relationship found between governance structure and performance.

Keywords: Corporate governance, Efficiency, Data Envelopment Analysis (DEA), Financial performance.

INTRODUCTION

A public company is defined by the European Economic Community (EEC) directive of 1980 as «any firm over which the public authorities may exercise directly or indirectly a dominant influence because of the financial participation or the rules which govern ». These companies are engaged in varied activities, although most of them are often found in specific sectors (basic industries, banking and insurance, education, health, energy, communication and transport). They also have various origins: some were created by the State, either to get tax revenue, or even for reasons related to national defense or industrial development. However, very often, most public companies come from nationalization processes like those of collective transport in Tunisia which have political and economic objectives.

Since 1963, the sphere of public transport by buses in Tunisia is subject to institutional and regulatory authorities. It is composed of 12 regional public companies; goods transport companies and a transit company covering the Greater Tunis. The structure of these regional companies' capital consists of the private shareholders and the state, represented by the regional governorates, the local groups and the city councils. Dominance on the capital level always falls to the state (> 51 % of the capital) and this varies from one company to another. It is about a public service of which the policy management is determined by a public figure who is the supervisory authority (the Ministry of Transport). Its functioning is assigned to a public operator through a program contract. The governing body is responsible for

developing the pricing policy, determining the volume of supply, the level of employment and the nature of funding. It is also responsible for the technical control of the transport means, the construction and the infrastructure management.

Furthermore, the government requires the operator to comply with a tariff equalization and well-defined social cuts for: students, the disabled, military people, etc.. This will result in a shortfall that must be compensated by the State in the form of subsidies. This leads us to examine whether governance structure plays a role in the performance of the RTC or not?

Therefore, this paper is organized as follows: First, we will deal with the birth of corporate governance and its different mechanisms. Then, we will present a literature review on the relationship between the governance structure efficiency and financial performance and to ensure a complete analysis, we will conduct an empirical application of the Tunisian public transport network so as to know its governance effectiveness, its structure and its impact on financial performance in the last decade.

Corporate governance

From an economic point of view, corporate governance is defined as a set of mechanisms which aim at an efficient resource allocation. Achieving this overall goal requires the mobilization of all the economic agents who can generate value. These agents can only be encouraged to engage themselves in productive activities that bring value to the company if their risky investments are protected. These agents are encouraged to engage in value-generating production activities for the company only when their risky investments are protected. Actually, in this context, investment is due to the fact that information is asymmetric and that some contracts are incomplete. Corporate governance mechanisms can therefore be intended to protect the interests of any contracting party with the firm which a risky investment. This may include the shareholders, creditors, employees, customers, suppliers, the community.

Corporate governance mechanisms

In his presidential report to the Annual Meeting of the American Finance Association, Jensen (1993) suggests four control mechanisms capable of reducing the

problems caused by the discrepancy between the management decisions and the ones optimal for the shareholders. These mechanisms are:

- Legal and regulatory mechanisms.
- Internal control mechanisms.
- External control mechanisms.
- Competition in the product market.

Among the governance factors belonging to these various mechanisms and which are used, mainly in the United States, in most of the studies to reduce the production costs, we find the shareholders' legal protection, the boards of directors, and the market takeovers (Gompers et al., 2003). Nevertheless, countries other than the United States, where there is less legal protection, have used ownership and financial structure that are found to be the most effective governance mechanisms. We will use these as inputs to determine the governance structure efficiency.

Ownership structure (majority shareholder): The existence of one or more shareholders having significant stakes will also make it possible for them to more easily build alliances in order to have their interests respected by the leaders. We might go so far as to find shareholders who have full control of the firm's asset value as they have more than 50% of the voting rights. The majority of stakeholders can therefore reduce the agency problems since it is in their interest to maximize the firm's value and have enough control over the management decisions through the voting rights, to get their interests respected.

Financial structure: In the context of the agency theory, the optimal capital structure would be the one that minimizes the agency costs that may occur as a result of the conflict of interest between the shareholders and the managers. Indebtedness encourages the managers to make more effort and consume the least in nature Grossman and Hart (1982). However, when indebtedness gets beyond certain limits, there may be adverse effects on the executives and shareholders' behavior. Excessive indebtedness may encourage the managers and the shareholders to take high risks, mainly when the company is in trouble.

Governance structure efficiency: A new respect

The effectiveness of the best governance mechanism

relationship with the financial performance of the companies no longer meets the demand of investors. The latter seeks to invest in companies with effective overall governance structure since they tend to use variables that inform them about these firms' potential and adopt international standards of corporate governance. Therefore, from a decade back, researchers' goal on governance is shifted to the search for an optimal combination of governance mechanisms. This has led recent studies to measure the effectiveness of governance structure by taking into account all the mechanisms in order to classify the firms. This means that companies which comply with the principles proposed by the codes of good practice have a "good governance" structure.

Impact of an efficient governance structure on the firm's performance: Literature Review

Most of the studies that analyzed the relationship between corporate governance and the firm's performance took governance as an exogenous variable in the regression of the firm's performance. However, this consideration is not obvious since the recent researches have considered governance as an endogenous variable. Governance variable is carried out according to various considerations. Some researchers have applied a simple linear regression where the governance structure variables are endogenous. Moreover, they have also used a simultaneous equation system where each equation takes, as endogenous variables, the variables showing one of the governance mechanisms (Agrawal and Knoeber, 1996; Demsetz and Villalonga, 2002; Beigner et al., 2006). In addition, some recent studies are oriented towards the search for efficient governance systems, taking into account all the governance mechanisms (Lehmann et al., 2002; Rouse et al., 2004; Dhahri, 2008).

Efficiency impact of the governance structure on the financial performance of RTC: Empirical Study

Our work focuses on two econometric parts; the first consists in identifying the effectiveness of the governance structure scores using the non-parametric approach (Method of Data Envelopment Analysis "DEA"), while the second deals with the impact of the efficiency of the

governance structure on the performance of each RTC by performing a linear regression with the method of the ordinary least squares (OLS).

Efficiency of the governance structure of the RTCs: Econometric Study

Sample

To conduct our study, we established a panel type database on a sample of twelve Tunisian regional public transport companies covering the period from 2000 to 2010 on an annual basis. These data are, to a large extent, taken from reports of annual activities obtained from the Directorate General of the Land Transport of the Ministry of transportation. Measurement of the variables.

Inputs

Ownership structure (OS): Ownership structure is measured by the portion of the main shareholder in the firm's capital (percentage of the principal shareholder)

Financial structure (FS): According to Lehman et al. (2002), financial structure is presented by the debt ratio, which is the ratio between the total debt and total assets (total liabilities / total assets).

Outputs

According to Baumol (1959), Williamson (1964) and Marris (1964), investment (INV) and the company's turnover growth (CR) gives a more accurate picture about governance effectiveness. The investment (INV) factor can tell us about the over investments made in unprofitable projects following an abuse of managerial discretion.

Investment (INV): According to Lehman et al., (2002), investment is given by the ratio of the overall non-financial assets and total assets (total non-financial assets / total assets).

Turnover Growth (TG): For Lehman et al., (2002), turnover growth is made by the logarithm of the annual change in the turnover (See figure 1). $\text{Log}(CAn - CAn-1)$

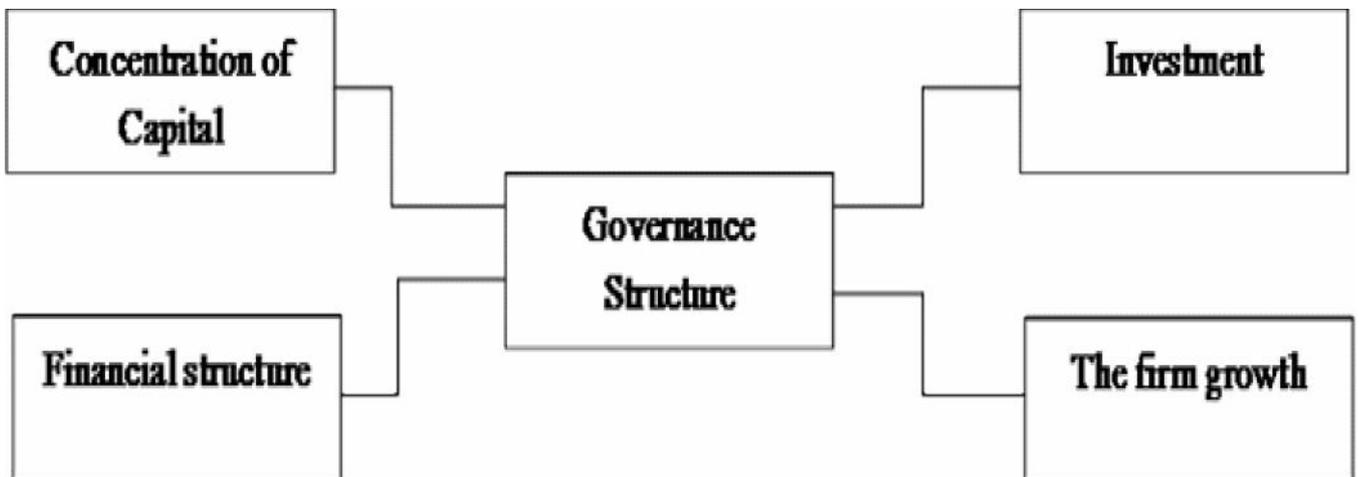


Figure 1. Variables

Table 1. Description of variables

Variables	Mean	SD	Minimum	Maximum
Inputs				
Ownership structure	0,786	0,142	0,530	0,980
Financial structure	1,035	0,285	0,587	2,215
Outputs				
Investment	0,613	0,196	-0,404	1,354
The firm growth	10,100	5,005	0	14,586

Description of the variables

In the sample we considered, the input "ownership structure" showing the percentage of the majority shareholder in each company varies between 0.53 and 0.98. The second input "financial structure" varies between 0.587 and 2.215 with an average of 1.035.

In addition, the outputs are two ratios which show the production and productivity of each company, where the first is investment that has an average of 0.613, and the second is the turnover growth which varies between 0 and 14,586 (See table 1).

The model shape

In this model, efficiency measure is defined as the total factor productivity. It is, in fact, a total efficiency measure without distinguishing technical efficiency from scale efficiency. This method identifies all the producers located on the production frontier to which we compare the firm's efficiency calculated score. The so called "input oriented" model is considered here (Coelli, 1996). An intuitive way to proceed with is to introduce the Data envelopment analysis (DEA) as a ratio between all the outputs and inputs of each decision unit (countries in our case), that is to say, like $u'yi / v'xi$.

The problem is therefore to identify the optimal weights for each decision unit by solving the following mathematical programming problem:

$$\begin{cases} \max_{u,v} (u'y_i/v'x_i) \\ \text{sc} \\ u'y_j/v'x_j \leq 1 & j = 1,2,\dots,N \\ u, v \geq 0 \end{cases}$$

$$\begin{cases} \max_{u,v} (u'y_i/v'x_i) \\ \text{sc} \\ v'x_i = 1 & \text{(A)} \\ u'y_j - v'x_j \leq 1 & j = 1,2,\dots,N \\ u, v \geq 0 \end{cases}$$

Where we replace u and v with θ and λ to show that it is a different linear program. Using the duality in linear programming, we obtain equivalent program (A) in the form of an envelope:

$$\begin{cases} \min \theta \\ \text{sc} \\ -y_i + \theta Y \leq 0 \\ x_i - \theta X \leq 0 & \text{(B)} \\ \theta \geq 0 \end{cases}$$

In this problem to be solved N times, θ is a scalar that represents the score of the technical efficiency of the i th decision unit ($\theta \geq 0$). If $\theta = 1$, the decision unit is then on the border, that is to say that it is effective in Farrell's meaning.

Inversely, if $\theta < 1$, this means that there is a technical inefficiency. θ is an $(N, 1)$ vector of constants called multipliers which show how the decision units combine to form the border to which the i th decision unit will be compared.

Results and interpretation

This section presents the results of the efficiency of the corporate governance structure calculated at constant returns to scale (CRS) and on the basis of an orientation to the input. The statistics of the annual average technical efficiency scores for the whole sample are presented in Appendix 2. Under the constant returns to scale technology (CRS), the average annual efficiency index of governance structure of the public transport system in Tunisia stood at 71.69% for the entire sample.

It is clear from Table 2 that Sousse RTC as well as that of Nabeul achieved the highest efficiency scores of governance structure. This explains the proper use of the indebtedness impact and the ownership concentration (Percentage participation of the private people is the highest compared to other firms) on the effectiveness of the governance structure (See figure 2).

According to Bouchikhi and Bendiabdellah (2008), public companies are neither subject to bankruptcy nor to the takeover mechanisms (two major disciplinary mechanisms of the market system), besides, the shareholders (the State) can neither sell their shares nor dismiss the managers. This is why public companies are often characterized by an excessive governmental interference and by a behavior seeking privileges.

However, the private shareholders' investment, a part of which is concentrated in the public transport companies, improve quality of control. This is made clear in Figure 3, where we can see that the more important the shareholders' investment is, the more efficient the governance structure is. Nevertheless, this does not prevent us from finding some exceptions, as it is the case of Kasserine, Mednine, Gafsa and Jendouba RTCs.

The relationship between the efficiency of the governance structure (GOV) and the financial performance of RTCs: Empirical Study

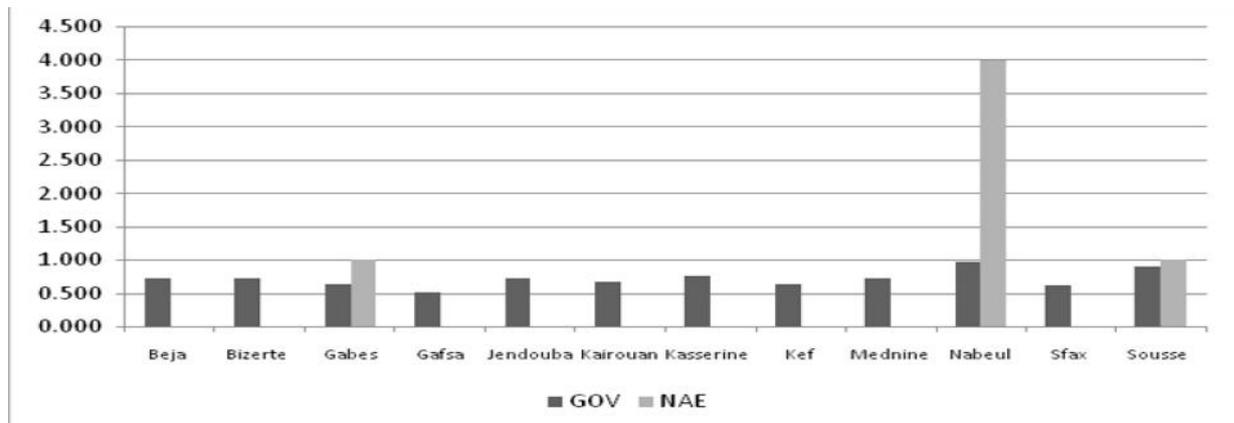
Measurement of variables (linear regression, MCO).

Dependent variables: Financial Performance

The return on assets (ROA): The return on assets variable is defined as the net profit divided by the total assets. This ratio is a profitability measure commonly used by many authors such as (Prowse 1992. Barro and Barro, 1990; Gedoylovic and Shapiro, 2002). The

Table 2. Efficiency scores of governance structure

RTC	Mean	Rank	SD	Minimum	Maximum
Beja	0,721	6	0,08	0,626	0,839
Bizerte	0,725	5	0,04	0,612	0,774
Gabes	0,638	9	0,12	0,556	1
Gafsa	0,517	12	0,08	0,382	0,620
Jendouba	0,718	7	0,11	0,554	0,916
Kairouan	0,670	8	0,05	0,598	0,739
Kasserine	0,754	3	0,07	0,599	0,852
Kef	0,634	10	0,14	0,443	0,811
Mednine	0,732	4	0,09	0,507	0,843
Nabeul	0,975	1	0,03	0,892	1
Sfax	0,615	11	0,09	0,478	0,821
Sousse	0,904	2	0,07	0,732	1

**Figure 2.** Overview of the degree of the governance structure efficiency and the effective number of years produced by each RTC (NAE: Number of efficient year)

return on assets is generally the economic profitability. Its strength lies in the fact that it fully covers all the company's activities. Its weakness is that it considers all of the assets identical at risk while the risks arising from the components of total assets are different,

The return on equity (ROE): The return on equity (ROE) variable is defined as the net profit divided by the book value of equity earnings. This ratio is a measure of the

financial performance or even the shareholders' rate of return, which was used by many authors, such as (Ang et al., 2002; Brown and Marcus, 2009; Brown and Caylorb, 2009). It examines how efficiently the company uses the capital entrusted to it by the shareholders. The weakness of this ratio lies in the fact that it does not give a clear picture of profitability since a high ratio may be caused by a low level of equity capital.

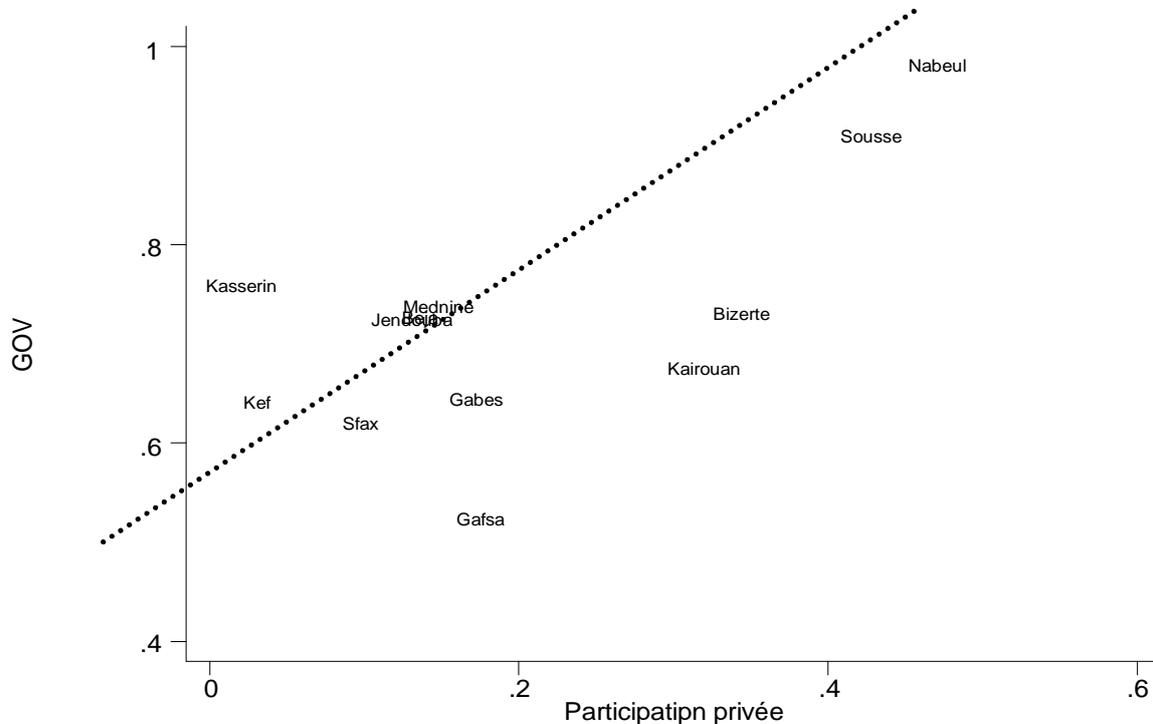


Figure 3. The relationship between the efficiency of the structure Governance (GOV) and the Share of Private Participation in RTC

Independent variables

Governance Score (GOV): The governance scores of each company obtained using the Data Envelopment Approach (DEA). Most studies found a positive relationship between the efficiency of governance structure and the firm's financial performance (Lehmann et al., 2002; Rouse et al., 2004 and Dhahri, 2008). This leads us to advance the following hypothesis.

Hypothesis 1: we expect the effect of this variable to be positive.

The size of the firm (SIZE): Lehman, Warning and Weigand (2002) and Belkhir (2009), consider the size of the firm as a control variable, which is calculated by the natural logarithm of the total assets, Log (total assets). However, Baumel (1959) thinks that a significant economy of scale positively affects the size of the company. In our case, the Tunisian RTC has a

budget deficit. This makes us advance the following hypothesis.

Hypothesis 2: we expect this variable to have a negative effect.

Variables description

In the current sample, the dependent variables showing the financial performance of each company, such as the returns on assets (ROA), the return on equity (ROE), range respectively from (-0.939, 0.618) to (-5.484, 6.189), with an ROA average (-0.029) and ROE (0.031). Moreover, there are two independent variables; the first is a score of the governance structure efficiency, which varies between (0.382) and (1) and averaging (0.717). The second is a control variable (the firm size (SIZE), which ranges from (14.776) to (17.405) and averaging 16,115 (See table 3).

Table 3. Description of variables

Variables	Mean	SD	Minimum	Maximum
<u>dependent variables</u>				
ROA	-0,029	0,124	-0,939	0,618
ROE	0,031	1,040	-5,484	6,189
<u>independent variables</u>				
GOV	0,717	0,148	0,382	1,000
SIZE	16,115	0,593	14,776	17,405

Table 4. Correlation matrix

	ROA	ROE	GOV	SIZE
ROA	1			
ROE	0,1558	1		
GOV	-0,0884	-0,2835	1	
SIZE	-0,3033	-0,0928	0,1782	1

The model shape

The value of the dependent chosen variable (ROA; ROE) is small (<1). This should lead us to think about which estimation model to choose, a Tobit regression or a simple linear regression. The Tobit model is recommended in cases where there is a large discrepancy value between the dependent and the independent variables. In our study, the first independent variable (GOV) is inferior to 1, whereas the second is not quite large (average 16,115). Therefore, there is not a wide discrepancy between the endogenous and exogenous variables. In addition, one of the weaknesses of a Tobit model is that it requires a hypothesis about the interdependence of the scores in relation to each other, an unverified condition. Thus, the model to be tested is as follows:

$$\text{PERFORMANCE} = + \beta_{it} \text{GOUVERNANCE} + \beta_{it} \text{SIZE}$$

$$\text{ROA; ROE} = + \beta_{it} \text{GOV} + \beta_{it} \text{SIZE}$$

With ROA: Returns on assets; ROE: Returns on equity; GOV: Efficiency score of governance structure of each RTC; SIZE : Size of the firm

Results and interpretation

Univariate analyses

To make sure that there is no problem of multi-collinearity between the independent variables, we calculated Pearson's correlation coefficients between these variables (Table 4). It is clear from this table that all the correlation coefficients are lower than (0.8), which means that there is no problem of multi-collinearity.

The examination of the correlation matrix (Table 4) shows that there is a univariate relationship between the dependent variables (ROA, ROE) and the independent ones (GOV) and (SIZE). This relationship has a positive sign between both of the dependent variables (ROA) (ROE) as well as between both of the independent ones (GOV) and (SIZE). However, the other relationships are negative.

Interpretation and discussion of the regression results

In this research, we have conducted two comparative regressions using two different dependent variables-such

Table 5. Comparative regressions

	ROA		ROE	
	Coefficient	SD	Coefficient	SD
GOV	-0,029	0,070	-1,942***	0,603
SIZE	-0,061***	0,017	-0,076	0,150
_cons	0,991***	0,278	2,658	2,386
R²	0,389		0,082	
Number of observations	132		132	
F-statistic	2,1		0,96	
Prob> F	0,0253<10%		0,4830>10%	
Hausman test				
Chi 2	2,79		Prob> F is more than 5% .we have chosen a simple linear regression model with OLS	
Prob> Chi2	0,247			

This table shows the regression results of the governance structure efficiency on the financial performance of RTC. The sample contains 132 observations of 12 Tunisian RTC. (*), (**) And (***) indicate significance respectively at 10% 5% and 1%

as return on assets (ROA) and return on equity (ROE). Table 5 shows that half of the coefficients are significant at 1%. The regressions suggest the impact of the efficiency of governance structure and the size of each RTC on financial performance.

The efficiency impact of governance structure (GOV) on the RTC financial performance

Return on assets (ROA)

At regression (ROA), we find a negative and insignificant relationship between the efficiency of the governance structure (GOV) and the return on assets (ROA). To strengthen our results, we made a graph showing the relationship between the return on assets (ROA) and the efficiency of the governance structure (GOV).

Looking at the «ROA\GOV» chart, we only notice indiscriminately scattered points each representing a RTC. This does not confirm our hypothesis that states, on the basis of previous studies, that improving the efficiency of the governance structure increases financial

performance. Thus, the non-significance of the variable (GOV) is explained (Figure 4).

Return on equity (ROE) : The (ROE) regression shows a negative and statistically significant relationship between the efficiency of the governance structure and the return on equity (ROE). This does not justify our hypothesis which states, according to previous studies (Lehmann et al., 2002; Rouse et al., 2004; Dhahri, 2008), that improving the efficiency of governance structure increases financial performance. This excessive government interference can be explained by the type of the public firms selected for our sample. These companies differ from the private ones at the level of the takeover mechanisms and the activities management (shareholder (government) cannot sell their shares, or fire the managers). However, in private companies, the shareholders can express their discontent either by selling their shares or by attending the shareholders' general meeting in an attempt to dismiss the ineffective directors. To strengthen the statistical result, we have made a chart showing the relationship between the returns on equity and the efficiency of governance structure (GOV).

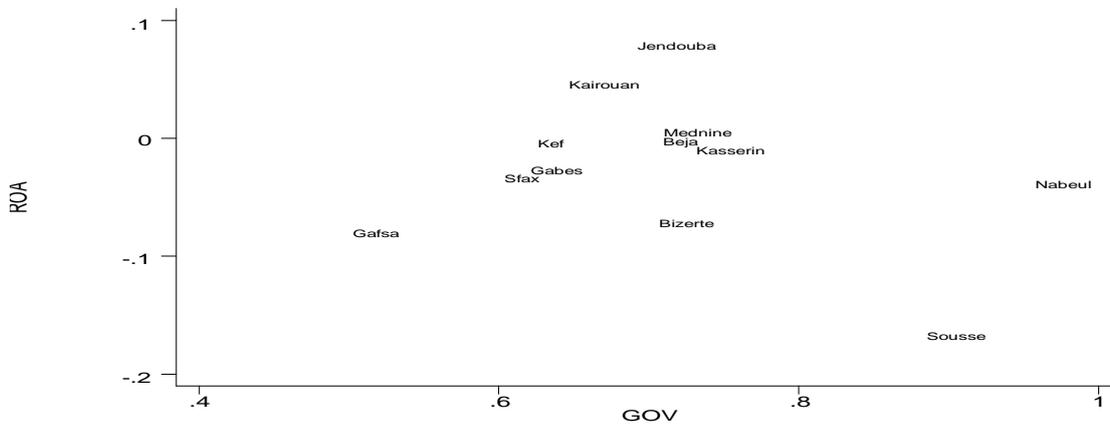


Figure 4. The Relationship Between Return on assets (ROA) and the efficiency score of the Governance Structure (GOV) of RTC

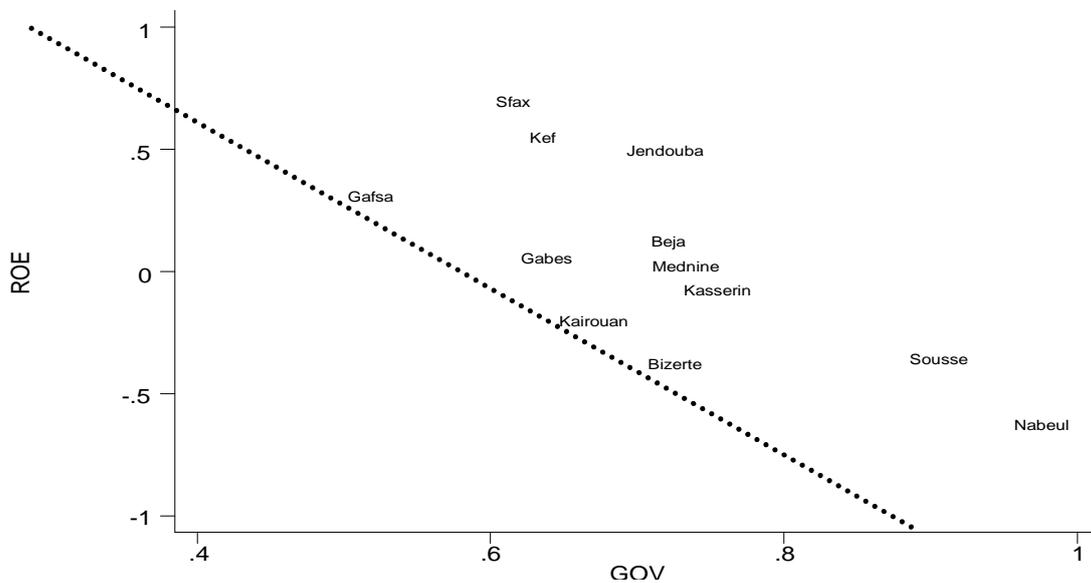


Figure 5. The relationship between Return on Capital Own (ROE) and the score of the Structure Governance Efficiency (GOV)

Through this chart (Figure 5), we notice that most of the RTCs are located to the right and to the left of the linear downward straight line, which confirms the statistical

result showing that there is a negative relationship between the efficiency of the governance structure (GOV) and the returns on equity (ROE).

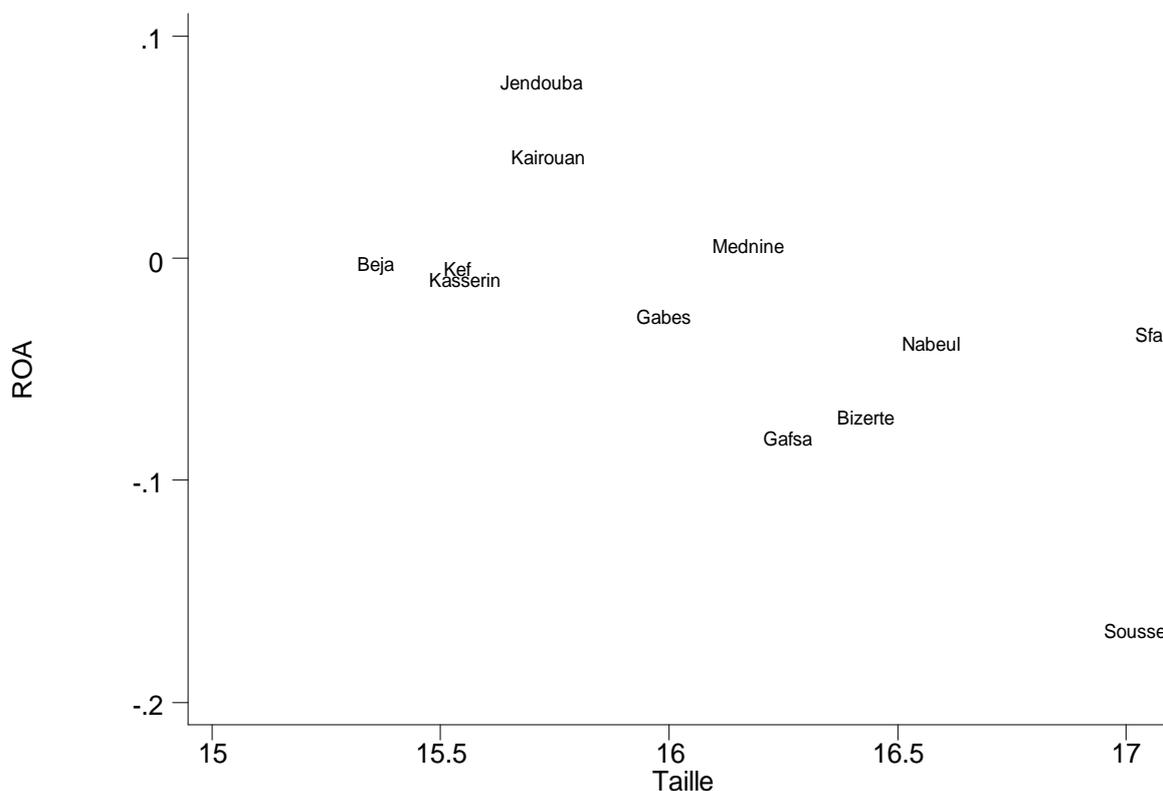


Figure 6. The Relationship between return on assets (ROA) and the size of the company

The impact of firm size (SIZE) on the RTCs' financial performance

Return on assets (ROA): At the (ROA) regression, we notice a negative and significant relationship between the size of the company (SIZE) and the return on assets (ROA). This confirms our hypothesis which states that the increase in the firm size (total assets) implies a weak financial performance.

To strengthen our results, we have made a chart showing the relationship between the return on assets (ROA) and the firm size (SIZE)

By looking at the "ROA/SIZE" chart (Figure 6), we notice that most of the RTCs are located to the right and the left of the linear downward straight line, which confirms our hypothesis stating that there is a negative

relationship between the firm size (SIZE) and the returns on assets (ROA).

Return on Equity (ROE): At the (ROE) regression, there is a negative and insignificant relationship between the firm size (SIZE) and the returns on equity (ROE).

CONCLUSION

The aim of this section is twofold. At first, we intended to determine the optimal combination of governance mechanisms so as to identify the efficiency index that corresponds to each regional transport company. Then, we looked for the relationship between the efficiency of the governance structure and financial performance to

check whether the public companies confirm the results of the previous studies on the private market or not?

The results of the first stage showed that the governance structure of the public transport system in Tunisia is efficient at 71.69%. The efficiency score ranges from 0.517, achieved by Gafsa RTC, to 0.975 attained by Nabeul RTC. At the second stage, we have made a regression between the efficiency scores of governance structure, the size of each firm (Log Total Assets) and the financial performance represented by two ratios such as the return on assets (ROA) and the return on equity (ROE). The obtained results show that there is a negative relationship between governance structure and financial performance in each company. This result does not confirm the earlier studies conducted on publicly traded companies or on banks. We have explained this governmental interference by the nature of our sample which consists only of public monopolies. These are neither subject to bankruptcy nor to takeover mechanisms (two major disciplinary mechanisms of the market system), this can only bring bad results.

This weak corporate governance system is due to several factors, such as:

- The low level of efficiency
- The poor record of the revenue collection
- the lack of transparency and accountability

Finally, the unclear roles for the various stakeholders. This is also clear in the complex relationships between the various players: the government, the boards of directors of the public monopolies, the management of public companies, and the employees.

Improving the governance structure can be achieved via the creation of an effective board of directors, a clear relationship between the board and the management, defined obligations and management responsibilities, and finally mechanisms to protect all the various interests.

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Appendix

Studies	Data Description	Variables used with the method of Data Envelopment Analysis		2nd type of model	Empirical result
		Inputs	Outputs		
Lehmann, Warning & Weigand (2002)	Data on a sample of 361 German companies for the period 1991 to 1996	The ownership structure. The capital structure	Investment The growth of the firm sales	Linear regression examining the relationship between the effectiveness of the governance structure and the financial performance	performance and governance are significantly related
Rouse.P. Wong.J Yeo.V. (2004)	Data on a sample of 213 companies from the database, Data-Stream for the period 1997 to 2001	Concentration of the ownership. The capital structure. Composition of the Board Capital Intensity.	Index growth of the company. Profitability Index and Investment	Linear regression examining the relationship between the effectiveness of the governance structure and the financial performance	Positive and significant relationship between the efficiency of governance and profitability.
Dhahri.N (2008)	Data on a sample of 41 companies listed on the Tunisian Stock Exchange for the period 2000 to 2003	Concentration of ownership (% major shareholder). The financial structure (debt).	Investment. The growth in turnover	Linear regression examining the relationship between the effectiveness of the governance structure and the financial performance	The relationship between the quality of governance and firm performance does depend on the identity of the majority shareholder.

Efficiency of Governance Structure of RTC

Variables	Mean	SD	Minimum	Maximum
2000	0,776	0,171	0,415	1
2001	0,729	0,166	0,446	0,977
2002	0,716	0,182	0,443	1
2003	0,740	0,152	0,516	1
2004	0,708	0,146	0,488	0,956
2005	0,655	0,152	0,382	0,944
2006	0,730	0,125	0,566	0,998
2007	0,726	0,127	0,589	0,990
2008	0,724	0,140	0,463	1
2009	0,689	0,152	0,507	0,971
2010	0,694	0,129	0,556	1
Mean	0,7169			