

Corporate Social Responsibility and Financial Performance: Evidence from Tunisian Market.

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Abstract:

The issue of this paper is to assess the contribution of social responsibility on the development and increase of corporate financial performance. Our paper uses a sample of Tunisian companies from industrial and service sector to test the relationship social-financial performance using three steps representing the responsibility to employees, the environmental responsibility and responsibility to the community. The results have stipulated the existence of significant relationship.

Key words: Corporate finance, financial performance social responsibility.

Jel classification: G03, G39.

1. Introduction

Our research studied the relationship between financial performance and social performance (RSE), the concept of RSE is defined as the willingness of companies to integrate the triple bottom line strategy in their activities. The integration of social and environmental principles gives the company a greater role and more complex and additional responsibilities towards society.

The purpose of this study is to question the existence of a relationship between financial performance (FP) and social performance (PS) of industrial and service companies, its nature and its direction in a context of developing countries. Specifically, this article aims to test the relationship social-financial performance by breaking RSE performance variable measuring the social performance in 3 steps representing the responsibility to employees (RSE-EMP), the environmental responsibility (RSE -ENV) and responsibility to the community (RE-COM).

The study of this relationship requires the use of more detailed variables on social performance ie, the responsibility towards employees, the environment, and the community, to further refine the results found and determines the cause of the impact.

For this end the article is divided into three sections; in the second section, we present the research methodology with the sample, the study variables and model. In the third section, we will present the empirical results from the impact of different criteria of societal performance on financial performance. Finally, a discussion of the impact of financial performance on different measures of societal performance will be studied in a fourth section and a fifth section will include the conclusion of this research.

2. Methodology:

2.1. Sample presentation:

The sample involved in this study allows us to study the relationship between the different criteria of corporate social performance and financial performance for 17 companies listed on the stock exchange in Tunis (TSE) during the period the study from 2007 to 2001 (see table 11).

2.2. Data :

In this article, we use quantitative variables and we will add, over previous studies, different criteria of social responsibility and their interactions with financial performance.

Quantitative variables:

The *Return On Assets ratio* (ROA) measures the profitability of the company on the effective use of its assets. This ratio is expected to be positively correlated with social performance.

The ROA ratio is calculated as follows:

$$\text{ROA} = \text{Net income} / \text{Total assets}$$

The *Return On Equity* (ROE) measures the performance of equity invested by shareholders. Previous studies assumed that this ratio positively affects the social behavior of the company.

The ROE ratio is measured as follows:

$$\text{ROE} = \text{Net income} / \text{Capital}$$

The *Net profit margin* (MBN): measures the final profitability after the company released tax on each monetary unit of turnover. It is supposed to be positively related to societal performance.

The MBN is measured as follows:

$$\text{MBN} = \text{Net income} / \text{Turnover}$$

The *Solvency ratio*: the ratio can reveal the financial pressure. The more the company is solvent the more it engages in social actions.

It is calculated as follows:

$$\text{Solvency ratio} = \text{Debt} / \text{Capital}$$

These variables are derived from corporate balance sheets that underpin our empirical study:
 - *Beta*: measures the volatility of an investment or action in relation to that market. The risk is assumed to be negatively correlated with social performance.

The beta is measured as follows:

$$\beta_i = \frac{\text{cov}(R_i, R_m)}{V(R_m)}$$

With :

β_i : systemic risk ;

R_i : return of stock i ;

R_m : return of the hole market.

Qualitative data :

- *RSE-EMP*: Corporate responsibility towards employees which includes occupational health and safety, training and development of employees, equal opportunities, the practice of good employee relations and employment creation system.

- *RSE-ENV*: all responsible actions that take into account the environmental dimension. This variable is evaluated by the quality of environmental policy, environmental management system and disclosure of environmental reports.

- *RES-COM*: measures corporate responsibility to the community through respect for human rights, the adoption of codes of ethics, relationships with NGOs and finally the relationships with key stakeholders (consumers, employees).

All these measures and their notes are summarized in Table 8.

2.3. Model:

To confirm or refute the results found regarding the existence of a relationship of "feedback" between financial performance (FP) and social performance (SP) in the context of the

Tunisian market, we will test in this section both models following:

- The impact of different criteria of PS on the PF (model (3)).
- The impact of PF on the different criteria of PS (model (4)).

The models used to verify the existence and nature of the relationship between the various criteria of social responsibility and financial performance are:

Model (3) the impact of different criteria of CSR on financial performance

$$ROA_{it} = \alpha_0 + \alpha_1 RS_{it} + \alpha_2 RQ_{it} + \alpha_4 RSE_{EMP_{it}} + \varepsilon_{it} \quad (7)$$

$$ROA_{it} = \gamma_0 + \gamma_1 RS_{it} + \gamma_2 RQ_{it} + \gamma_4 RSE_{ENV_{it}} + \varepsilon_{it} \quad (8)$$

$$ROA_{it} = \Upsilon_0 + \Upsilon_1 RS_{it} + \Upsilon_2 RQ_{it} + \Upsilon_4 RSE_{COM_{it}} + \varepsilon_{it} \quad (9)$$

$$ROE_{it} = \alpha_0 + \alpha_1 RS_{it} + \alpha_2 RQ_{it} + \alpha_4 RSE_{EMP_{it}} + \varepsilon_{it} \quad (10)$$

$$ROE_{it} = \gamma_0 + \gamma_1 RS_{it} + \gamma_2 RQ_{it} + \gamma_4 RSE_{ENV_{it}} + \varepsilon_{it} \quad (11)$$

$$ROE_{it} = \Upsilon_0 + \Upsilon_1 RS_{it} + \Upsilon_2 RQ_{it} + \Upsilon_4 RSE_{COM_{it}} + \varepsilon_{it} \quad (12)$$

$$MBN_{it} = \alpha_0 + \alpha_1 RS_{it} + \alpha_2 RQ_{it} + \alpha_4 RSE_{EMP_{it}} + \varepsilon_{it} \quad (13)$$

$$MBN_{it} = \gamma_0 + \gamma_1 RS_{it} + \gamma_2 RQ_{it} + \gamma_4 RSE_{ENV_{it}} + \varepsilon_{it} \quad (14)$$

$$MBN_{it} = \Upsilon_0 + \Upsilon_1 RS_{it} + \Upsilon_2 RQ_{it} + \Upsilon_4 RSE_{COM_{it}} + \varepsilon_{it} \quad (15)$$

Model (4) the impact of financial performance on different measures of RSE

$$RSE_{EMP_{it}} = \beta_0 + \beta_1 RS_{it} + \beta_2 RQ_{it} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (16)$$

$$RSE_{EMP_{it}} = \delta_0 + \delta_1 RS_{it} + \delta_2 RQ_{it} + \delta_4 ROA_{it} + \varepsilon_{it} \quad (17)$$

$$RSE_{EMP_{it}} = \theta_0 + \theta_1 RS_{it} + \theta_2 RQ_{it} + \theta_4 ROA_{it} + \varepsilon_{it} \quad (18)$$

$$RSE_{ENV_{it}} = \beta_0 + \beta_1 RS_{it} + \beta_2 RQ_{it} + \beta_4 ROE_{it} + \varepsilon_{it} \quad (19)$$

$$RSE_{ENV_{it}} = \delta_0 + \delta_1 RS_{it} + \delta_2 RQ_{it} + \delta_4 ROE_{it} + \varepsilon_{it} \quad (20)$$

$$RSE_{ENV_{it}} = \theta_0 + \theta_1 RS_{it} + \theta_2 RQ_{it} + \theta_4 ROE_{it} + \varepsilon_{it} \quad (21)$$

$$RSE_{COM_{it}} = \beta_0 + \beta_1 RS_{it} + \beta_2 RQ_{it} + \beta_4 MBN_{it} + \varepsilon_{it} \quad (22)$$

$$RSE_{COM_{it}} = \delta_0 + \delta_1 RS_{it} + \delta_2 RQ_{it} + \delta_4 MBN_{it} + \varepsilon_{it} \quad (23)$$

$$RSE_{COM_{it}} = \theta_0 + \theta_1 RS_{it} + \theta_2 RQ_{it} + \theta_4 MBN_{it} + \varepsilon_{it} \quad (24)$$

With:

- ROA_{it} : return ratio of the asset of the company i on t ;
- ROE_{it} : return ratio of capital of the company i on t ;

- MBN_{it} : net profit margin of the company i on t ;
- RSE_{EMP} : the corporate responsibility to employees;
- RSE_{ENV} : corporate environmental responsibility ;
- RSE_{ENV} : the corporate responsibility towards society ;
- RS_{it} : the solvency ratio of firm i in time period t;
- RQ_{it} : the company's systematic risk i at time t;
- ε_{it} : An error term.

3. Results :

3.1.Descriptive statistics

Descriptive statistics for all variables used in the study of the relationship criteria of financial performance, social performance, for both, industrial and service are summarized in Tables 19 and 20:

Comparing the averages, we see that the level of RSE is high in the industrial sector and the service sector. This means that stakeholders attach more importance to social performance more industrial companies than service companies.

3.2. Correlation matrix :

According to the correlation matrix shown in Table 21 and 22, we can see that:

For the industrial sector, the various measures of societal performance are positively and strongly correlated, and for ROE and MBN. We also note that the RS is strongly linked with the ROA.

For the service sector, the RSE-COM criterion is correlated with RSE-CSR criteria. Financial performance measures are positively correlated.

3.3. Regressions' test:

To apply the panel data, one should check the models of homogeneity assumption by the test file so we can apply on the entire sample.

In addition, the *Hausman test* is necessary to distinguish the fixed models and variables models.

We will subsequently empirically test the relationship between different aspects of social performance on financial performance and try to confirm or refute the hypothesis that states the presence of a feedback relationship between the two performances.

3.3.1. Homogeneity test and Hausman test: impact of different measures of social responsibility on the financial performance

➤ **For equation (7) : $ROA = RSE-EMP + RQ + RS + Cste$**

The two P-Value recorded in Table A are strictly less than 5% therefore we accept the hypothesis 1 and the fixed effect model is retained for both sectors.

➤ **For equation (8) : $ROA = RSE-ENV + RQ + RS + Cste$**

The fixed effect model was used for the industrial sector since its P-value is greater than 5%, according to table B; The P-value for the service sector is more than 5% so the model chosen is the one random effect.

➤ **For equation (9) : $ROA = RSE-COM + RQ + RS + Cste$**

The fixed effect model was used for the industrial sector since its P-value is less than 5%, according to Table C. The P-value for the service sector is more than 5% so the model chosen is the one random effect.

➤ **For equation (10) : $ROE = RSE-EMP + RQ + RS + Cste$**

The two P-Value recorded in the table above are strictly greater than 5%, according to Table D, therefore we accept the null hypothesis and the random effects model is retained for both sectors

➤ **For equation (11) : $ROE = RSE-ENV + RQ + RS + Cste$**

The two P-Value recorded in the table above are strictly less than 5%, according to Table E, thus the fixed effects model is retained for both sectors.

➤ **For equation (12) : $ROE = RSE-COM + RQ + RS + Cste$**

The two P-Value recorded in the table above are strictly less than 5%, according to Table F, thus the fixed effects model is retained for both sectors.

➤ **For equation (13) : $MBN = RSE-EMP + RQ + RS + Cste$**

The random effects model was used for the industrial sector since its P-value is greater than 5%, according to table G. The P-value for the service sector is less than 5% so the chosen model is a fixed effect.

➤ **For equation (14) : $MBN = RSE-ENV + RQ + RS + Cste$**

The two P-Value recorded in the table above are strictly greater than 5%, according to Table H, therefore we accept the null hypothesis and the random effects model was used for the two sectors.

➤ **For equation (15) : $MBN = RSE-ENV + RQ + RS + Cste$**

The two P-Value recorded in the table above are strictly greater than 5%, according to Table I, therefore we accept the null hypothesis and the random effects model is retained for both sectors.

3.3.2. *Homogeneity test and Hausman test: impact of financial performance on different criteria of financial performance*

➤ **For equation (16) : $RSE-EMP = ROA + RQ + RS + Cste$**

The random effects model was used for the industrial sector since its P-value is greater than 5%, according to Table J. The P-value for the service sector is less than 5% so the chosen model is a fixed effect.

➤ **For equation (17) : $RSE-ENV = ROA + RQ + RS + Cste$**

The two P-Value recorded in the table above are strictly greater than 5%, according to table K. Therefore we accept the null hypothesis and the random effects model was used for the two sectors.

➤ **For equation (18) : $RSE-COM = ROA + RQ + RS + Cste$**

The two P-Value recorded in Table L are strictly greater than 5% therefore we accept the null hypothesis and the random effects model was used for the two sectors.

➤ **For equation (19) : $RSE-EMP = ROE + RQ + RS + Cste$**

The two P-Value recorded in Table M is strictly greater than 5% therefore we accept the null hypothesis and the random effects model is retained for both sectors

➤ **For equation (20) : $RSE-ENV = ROE + RQ + RS + Cste$**

The two P-Value recorded in Table N is strictly greater than 5% therefore we accept the null hypothesis and the random effects model is retained for both sectors

➤ **For equation (21) : $RSE-COM = ROE + RQ + RS + Cste$**

The random effects model was used for the industrial sector since its P-value is greater than 5%; according to Table O. The P-value for the service sector is less than 5% so the chosen model is a fixed effect.

➤ **For equation (22) : $RSE-EMP = MBN + RQ + RS + Cste$**

The random effects model was used for the industrial sector since its P-value is greater than 5%; according to Table P. The P-value for the service sector is less than 5% so the chosen model is a fixed effect.

➤ **For equation (23) : $RSE-ENV = MBN + RQ + RS + Cste$**

The random effects model was used for the industrial sector since its P-value is greater than 5%; according to the table Q. The P-value for the service sector is less than 5% so the chosen model is a fixed effect.

➤ **For equation (24) : $RSE-COM = MBN + RQ + RS + Cste$**

The two P-Value recorded in Table R are strictly greater than 5% therefore we accept the null hypothesis and the random effects model is retained for both sectors.

4. Discussion :

4.1. Discussion of the impact of different measures of social responsibility on the financial performance

For the industrial sector, the model (3), presented in Table 23, shows the presence of:

- A statistically significant positive and negative relationship between the two variables respectively RS-EMP and RS and return on assets (ROA), but no relationship was found between the other criteria of RSE and ROA.
- A significant impact of RS on the ROE, the various PS criteria and RQ did not.
- A neutral relationship between MBN and the different criteria of RSE.

- While in the service sector, the three variables (RSE-EMP) (RSE-ENV) and (RSE-COM) are not statistically significant. But RSE-COM has a significant impact on the MBN.

The social actions directed to employees, reduce the PF measured by ROA, this result contradicts that found by **Freeman (1984)** which supports the idea that the company forging good relations with its stakeholders, improve its financial performance.

In cons, the significant and positive relationship between RSE-COM and MBN in the service sector is in the lines of **Freeman (1984)** in the sense that maintaining a good relationship with the community means available to a quality management that generates lower expenses and thus increased profits.

4.2. Discussion of the impact of financial performance on different criteria of financial performance

For the industrial sector, presented in Table 24, the model (4) shows the existence of:

- Significant and negative relationship between MBN as an explanatory variable, measuring the profitability of the company and RSE-EMP, so we conclude the existence of "feedback" between the two variables; this means that despite easy financial position, the major concern of entrepreneurs is to increase profits at the expense of the development of good employee relations.

No significant relationship between other criteria of RSE (RSE-ENV and RSE-COM) and the MBN:

- No significance of the control variables used (RQ and RS), the systematic risk and financial risk of the company are not relevant variables when analyzing the impact of PF on the PS.

- For the service sector, MBN measuring the profitability of the company has a statistically significant and positive impact on RSE-COM, so there was a relationship of "feedback" positive between these two variables, in contrast, the RSE -EMP and RSE-ENV.

- For the control variables, systematic enterprise risk (RQ) is statistically significant in the analysis of the relationship between RSE-EMP and the ROA and the relationship between RSE-COM to MBN so the RQ is, according to the literature, relevant control variable.

5. Conclusion

Models using the global variable of RSE, in industry, indicate that there is a relationship of "feedback" significant and negative between RSE and the PFE when the latter is measured by ROA.

But regarding the service sector, no relationship is verified meaning that RSE is a case of the industrial sector, ie, stakeholders attach more importance to activities that affect the environment (pollution), so reactivity of industrial activities facing RSE is more important than the service sector.

Likewise, models that take into account the different components of RSE and their relations with measures of FP show the presence of a significantly positive relationship between responsibility to employees and financial performance.

However, in the commercial sector, unlike the model using the aggregate measure of RSE, there is a positive relationship between social performance and financial performance, in fact, if the company takes into account in its community affairs activities its MBN sees increase and vice versa.

The hypothesis of the existence of a relationship of "feedback" negative or positive between financial performance and social performance is validated, but we can not confirm the existence of a strong relationship between these two variables.

So the student about that relationship persists an interesting research avenue for future research in the field of corporate social responsibility.

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Appendix

Mesaure's type	Pertinence regarding PS	Features / problems	Mode of production
Annual report	More symbolic as substantive (speech)	Subjective measure easily manipulable	By the firm
Pollution's indicator	Measures only one of the dimensions of the construct (environmental aspects)	objective measurement Does not apply to all companies	By an external organization to the company
Research by survey	Depends on the measures proposed. Possibility of high relevance to the concept but these measures reflect the priority actors perceptionsdes	perceptual measurement Manipulation possibilities related to the mode of administration	For the researcher who collects directly from the company using a questionnaire
Reputation's indicator	Confusion with the notion of reputation Overall measure of PSE	perceptual measurement Halo effect	By an external organism
Data given by external organism	Multidimensional measure, the adequacy theoretical models depends on the work mode	depends on the work mode Halo effect	By an external organism The firm

Source : Igalens et Gond (2003, p. 6)

Table 1: Features and relevance of the key measures of PS

Companies	Date of introduction on the stock market	Price of IPO	Sector
Adwya	2007	2.55	Industry
Air Liquide	1997	148.4	Industry
Société immobilière tuniso-saoudienne(SITS)	2006	11.00	Industry
Société frigorifique et brasserie de Tunis(SFBT)	1997	90.20	Industry
Alkimia	1997	38.60	Industry
Industries chimique de fluor (ICF)	1997	34.20	Industry
Artes	2008	13.00	Industry
Essoukna	2006	4.70	Industry
Société immobilière et de participation(SIMPAR)	1997	27.80	Industry
Société de transport des hydrocarbures par pipelines(SOTRAPIL)	2001	12.50	Industry
Société tunisienne des industries pneumatiques(STIP)	2002	16.10	Industry
Ennakl automobiles	2010	17.05	Industry
Tunisair	1997	15.80	Industry
Société tunisienne d'entreprises de télécommunications(SOTETEL)	1998	23.00	Service
Magasin général	1999	15.56	Service
Monoprix	1997	33.52	Service

Table 2: Sample summary

Variable	Observation	Mean	Std	Minimum	Maximum
MBN	45	0.0910068	0.1608358	-0.2314685	0.4063089
ROE	45	0.0851238	0.1407418	-0.3771487	0.291763
ROA	45	0.0623991	0.130153	-0.1560718	0.6035604
RQ	45	0.3834122	0.6043004	-2.34406	2.386219
RS	45	3.257057	10.46258	0.2325189	69.12732
RSE-EMP	45	2.011622	0.5578075	0.43	2.8
RSE-ENV	45	2.177667	0.5198951	1.333	3
RSE-COMM	45	1.494089	0.7296331	0.5	2.75

Tableau 3: Descriptives statistics of industrial sector

Variable	Observation	Mean	Std	Minimum	Maximum
MBN	40	-1.947042	9.786912	-60.78381	0.4756199
ROE	40	0.051546	0.3536062	-1.173258	0.9302896
ROA	40	0.0284928	0.0700393	-0.1640636	0.2030884
RQ	40	0.5689387	0.427579	-0.0655859	1.677518
RS	40	2.230096	5.594435	0	36.0758
RSE-EMP	40	1.87325	0.5425866	1.2	3
RSE-ENV	40	1.403975	0.6864664	0.333	3
RSE-COM	40	1.410375	0.4429791	0.331	2.25

Table 4: Descriptive statistics of service sector

	RSE_EM	RSE_EN	RSE_CO	RS	beta	ROA	ROE	MBN
RSE_EMP	1							
RSE_ENV	0.7485	1						
RSE_COM	0.6534	0.6163	1					
RS	0.1062	-0.0852	-0.0045	1				
beta	0.0296	-0.0258	0.1830	0.0226	1			
ROA	-0.1056	0.0032	0.0090	0.5841	0.1459	1		
ROE	-0.1691	0.1439	0.1430	0.1536	0.2211	0.7466	1	
MBN	-0.3838	-0.1840	0.0018	-0.0309	0.2095	0.3812	0.6753	1

Table 5: Correlation matrix between the financial data, social responsibility, and the control variables in the industrial sector.

	RSE_EM	RSE_EN	RSE_CO	RS	beta	ROA	ROE	MBN
RSE_EMP	1							
RSE_ENV	0.4443	1						
RSE_COM	0.5089	0.4177	1					
RS	-0.1645	-0.0201	-0.0959	1				
beta	0.3659	-0.2976	0.3780	-0.2080	1			
ROA	-0.2604	-0.1943	-0.0521	0.0867	0.0132	1		
ROE	-0.1015	-0.2282	0.1713	0.0777	0.2812	0.6907	1	
MBN	0.2000	-0.0031	0.3826	-0.0641	0.1422	0.4596	0.5615	1

Table 6: Correlation matrix between the financial data, social responsibility, and the control variables in the service sector.

Sector	F calculated	F of the table	Decision rule
Sector of industry	2.2540575**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.5152564**	3.39	Hypothesis of homogeneity is accepted

** : Signif : 5%

Sector	Chi2	P-Value	Résultat
Sector of industry	9.46	0.0219	We accept H_0 . So the model is fixed effect
Sector of service	173.54	0.0000	We accept H_0 . So the model is fixed effect

Table A : P-value Test of homogeneity and Hausman test

Sector	F calculated	F of table	Rule of decision
Sector of industry	2.0631021 **	2.86	Hypothesis of homogeneity is accepted
Sector of service	0.87101471**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	11.58	0.0090	We accept H_0 . So the model is fixed effect
Sector of service	3.72	0.2935	We accept H_0 . So the model is random effect

Tableau B : P-value

Sector	F calculated	F of table	Rule of decision
Sector of industry	1.023456 **	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.14616113**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	21.19	0.0001	We accept H_0 . So the model is fixed effect
Sector of service	0.23	0.9901	We accept H_0 . So the model is random effect

Tableau C : P-value

Sector	F calculated	F of table	Rule of decision
Sector of industry	1.559673**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.4069642**	3.39	Hypothesis of homogeneity is accepted

** : Significativité au seuil de 5%

Sector	Chi2	P-Value	Results
Sector of industry	0.21	0.8913	We accept H_0 . So the model is random effect
Sector of service	0.30	0.9971	We accept H_0 . So the model is fixed effect

Tableau D : P-value

Sector	F calculated	F of table	Rule of decision
Sector of industry	0.67197**	2.86	Hypothesis of homogeneity is accepted
Sector of service	0.76353568**	3.39	Hypothesis of homogeneity is accepted

** : Significativité au seuil de 5%

Sector	Chi2	P-Value	Results
Sector of industry	19.42	0.0002	We accept H_0 . So the model is fixed effect
Sector of service	93.61	0.0000	We accept H_0 . So the model is fixed effect

Table E : P-value

Sector	F calculated	F of table	Rule of decision
Sector of industry	2.162877**	2.86	Hypothesis of homogeneity is accepted
Sector of service	0.94426147**	3.39	Hypothesis of homogeneity is accepted

** : Significativity au seuil de 5%

Sector	Chi2	P-Value	Results
Sector of industry	15.03	0.0001	We accept H_0 . So the model is fixed effect
Sector of service	9.29	0.0257	We accept H_0 . So the model is fixed effect

Table F : P-value

Sector	F calculated	F of table	Rule of decision
Sector of industry	1.047785**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.2257409**	3.39	Hypothesis of homogeneity is accepted

** : Significativité au seuil de 5%

Sector	Chi2	P-Value	Results
Sector of industry	0.81	0.9766	We accept H_0 . So the model is random effect
Sector of service	13.84	0.0008	We accept H_0 . So the model is fixed effect

Table G : P-value

Sector	F calculated	F of table	Rule of decision
Sector of industry	2.060711**	2.86	Hypothesis of homogeneity is accepted
Secteur de service	0.70337577**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	0.63	0.8900	We accept H_0 . So the model is random effect
Sector of service	5.16	0.1607	We accept H_0 . So the model is random effect

Table H : P-value

Sector	F calculated	F of table	Rule of decision
Sector of industry	2.830121 **	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.9311666**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	0.29	0.9625	We accept H_0 . So the model is random effect
Sector of service	0.09	0.9997	We accept H_0 . So the model is random effect

Table I : P-value

		Sector of industry	Sector of service
Model	Variable	coefficient	Coefficient
Equation (7)	RSE-EMP	-1.0568911	-0.0002541
	RQ	-0.0266909	0.001348
	RS	0.0062791*	0.001968
	cste	1.666246**	0.023813
Equation (8)	RSE-ENV	-0.564647	-0.0132399
	RQ	-0.328917	0.004944
	RS	0.005789*	0.0013699
	cste	0.1791164	0.0412135
Equation (9)	RSE-COM	-0.0499512	-0.0014177
	RQ	-0.0284601	0.0030177
	RS	0.0062959*	0.0011309
	Cste	0.1274367**	0.0262533
Equation (10)	RSE-EMP	-0.460018	-0.1566152
	RQ	-0.0288614	0.2979718
	RS	-0.002486**	-0.0026729

	Cste	0.1806308*	0.1813585
Equation (11)	RSE-ENV	-0.0120023	-0.3112928
	RQ	-0.0357755	0.157464
	RS	0.0023748	0.0213419**
	Cste	0.1172428	0.3514114
Equation (12)	RSE-COM	-0.0188992	-0.0749211
	RQ	-0.0356198	0.1474797
	RS	0.0024895**	0.020271**
	Cste	0.1189095*	0.0241832
Equation (13)	RSE-EMP	-0.0245465	4.190306
	RQ	-0.0065059	-3.318708
	RS	0.008769	0.5014757
	Cste	0.1400235**	-9.02673
Equation (14)	RSE-ENV	-0.0083764	-0.6883896
	RQ	-0.0073329	3.421473
	RS	0.0008082	-0.0594145
	Cste	0.109427	-2.794669
Equation (15)	RSE-COM	-0.0042272	8.463047**
	RQ	-0.0064908	-0.1989394
	RS	0.0008822	-0.0510333
	Cste	0.0969377	-13.65612*

* : significativity 1%

** : significativity 5%

Table 7: Results of model (3)

Sector	F calculated	F of table	Rule of decision
Sector of industry	2.9313977 **	2.86	Hypothesis of homogeneity is accepted
Sector of service	2.96623**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	1.18	0.7573	We accept H_0 So the model is random effect
Sector of service	15.60	0.0014	We accept H_0 So the model is fixed effect

Table J :

Sector	F calculated	F of table	Rule of decision
Sector of industry	0.1078459**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.245948**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	1.42	0.7011	We accept H_0 So the model is random effect
Sector of service	0.21	0.9752	We accept H_0 So the model is random effect

Table K :

Sector	F calculated	F of table	Rule of decision
Sector of industry	1.6676363**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.5843177**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	1.5	0.6815	We accept H_0 So the model is random effect
Sector of service	0.28	0.7712	We accept H_0 So the model is random effect

Tableau L :

Sector	F calculated	F of table	Rule of decision
Sector of industry	1.3418721**	2.86	Hypothesis of homogeneity is accepted
Sector of service	3.2860307**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	1.87	0.6815	We accept H_0 . So the model is random effect
Sector of service	2.67	0.4449	We accept H_0 . So the model is random effect

Table M :

Sector	F calculated	F of table	Rule of decision
Sector of industry	2.857835**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.037115**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	0.76	0.8585	We accept H_0 . So the model is random effect
Sector of service	4.30	0.2516	We accept H_0 . So the model is random effect

Table N :

Sector	F calculated	F of table	Rule of decision
Sector of industry	1.9603466**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.640463**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	1.26	0.7392	We accept H_0 . So the model is random effect
Sector of service	19.61	0.0009	We accept H_0 . So the model is fixed effect

Tableau O :

Sector	F calculated	F of table	Rule of decision
Sector of industry	1.5196426**	2.86	Hypothesis of homogeneity is accepted
Sector of service	0.0134864**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	1.59	0.6619	We accept H_0 . So the model is random effect
Sector of service	30.77	0.0000	We accept H_0 . So the model is fixed effect

Tableau P :

Sector	F calculated	F of table	Rule of decision
Sector of industry	2.056227 **	2.86	Hypothesis of homogeneity is accepted
Sector of service	0.00596643**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Results
Sector of industry	0.77	0.8566	We accept H_0 . So the model is random effect
Sector of service	22.47	0.0001	We accept H_0 . So the model is fixed effect

Table Q :

Sector	F calculated	F of table	Règle de décision
Sector of industry	2.3527597**	2.86	Hypothesis of homogeneity is accepted
Sector of service	1.4928343**	3.39	Hypothesis of homogeneity is accepted

** : Significativity 5%

Sector	Chi2	P-Value	Résultat
Sector of industry	1.06	0.6619	We accept H_0 . So the model is random effect
Sector of service	0.31	0.9577	We accept H_0 . So the model is random effect

Tableau R :

		Sector of industry	Sector of service
Model	Variable	coefficient	Coefficient
Equation (16)	ROA	-1.512064	-0.0110452
	RQ	-0.484793	0.0803042
	RS	0.115924	0.0006353
	cste	2.086804*	1.82646*
Equation (17)	ROA	-0.7477918	0.0927203
	RQ	-0.1572282	0.1027421
	RS	-0.0029329	0.0006493
	cste	2.294164*	1.341431*
Equation (18)	ROA	-0.9840471	-0.0756671
	RQ	-0.887646	0.3222028**
	RS	0.0070028	0.0076806
	Cste	1.566717*	1/212089*
Equation (19)	ROE	-1.294754	-0.2981261
	RQ	-0.0486972	.2668362
	RS	0.0048423	0.0010658
	Cste	2.124736*	1.734427*

Equation (20)	ROE	0.0757515	-0.1871191
	RQ	-0.141746	0.1323401
	RS	-0.0078625	0.0046531
	Cste	2.251174*	1.32795*
Equation (21)	ROE	-0.2255088	-0.1291007
	RQ	-0.0750061	0.2785365
	RS	0.0013157	0.0153895
	Cste	1.537758*	1.224239*
Equation (22)	MBN	-1.384838	0.0058482
	RQ	0.0023363	0.0977305
	RS	0.0030004	-0.0023342
	Cste	2.126984*	1.83424*
Equation (23)	MBN	-0.4244235	0.0025778
	RQ	-0.1404903	0.1028263
	RS	-0.0073115	-0.0004516
	Cste	2.293972*	1.351499*
Equation (24)	MBN	-0.1212307	0.0131158**
	RQ	-0.0677644	0.3187974**
	RS	0.0008559	0.0043374
	Cste	1.528316*	1.244863*

* : significativity 1%

** : significativity 5%

Table 8: Results of model (4)