CSR categories and R&D investment: the moderating role of Managerial emotional intelligence

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Abstract. *The purpose of this paper was to determine the important role of Chief Executive Officer emotional intelligence to explain the interaction relationship between research and development investment and corporate social responsibility categories. This research relied on the completion of a questionnaire type inquiry structured around the table-based analysis. The questionnaire was sent out to a large sample of Tunisian firms' Chief Executive Officer. The results of the 96 valid responses were entered for analysis by the partial least squares method. They show the significant effect of Chief Executive Officers' emotional intelligence on the relation between corporate social responsibility categories (customer, employee, community, territory and environment) and research and development investment. In addition, the Chief Executive Officer emotional intelligence provided explanations into research and development investment for the corporate social responsibility problems in Tunisia. Firstly, this study emphasized the important role of research and development investment in the corporate social responsibility categories. Secondly, a new data analysis method "decision-tree" was applied to estimate the moderating effects of managerial emotional intelligence on the CSR – R&D relationship.*

Keywords: Research and Development Investment, Emotional Intelligence, Corporate Social Responsibility Categories.

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Introduction

After the events of January 14, 2011, the outbreak of the Tunisian revolution, several organizations and agencies have been dynamically spreading awareness on the notion of social responsibility by enhancing companies to adopt a citizenship-orientated culture. These organizations include the Institute of Corporate Social Responsibility in Tunisia (IRSET), the International Centre for Environmental Technologies of Tunis (CITET), the Confederation of Tunisian Citizen Enterprises (CONNECT), as well as other governmental institutions, associations through the helpful technical assistance of some international cooperations. Corporate Social Responsibility (CSR) is defined by McWilliams and Siegel (2001) as involving "actions that appear to further some social good, beyond the

interests of the firm and that which is required by law" (p. 117). In addition, this concept dominates the world of business as well as the academic field in management studies (Crane et al., 2009). Schaltegger and Burritt (2018) believe that management activities based on ethical motivations for CSR lead to different operational activities for companies in order to achieve their objectives. Prior research notes a direct link between CSR and innovation (Mishra. 2017). To benefit from CSR strategies in terms of innovation, SMEs have to be practical (Chang. 2015; Martinez-Conesa et al., 2017). Torugsa et al. (2012) remind of the importance of positive CSR for SMEs' financial performance, and claim that strategic CSR links specifically to technological innovation.

Helen (2017) and Petrenko et al. (2016) proved that the behavioral theory is important in the explanation of an individual's psychological profile and/or emotions to understand the company's strategic decisions. Extraversion is one important personality trait that has been studied in finance. Wilt and Revelle (2017) concluded that "Extraversion reflects the likelihood that people display positive effect, assertive behaviour, decisive thinking and desires for social engagement and attention". Banerjee et al. (2018) examined the impact of the Chief Executive Officer (CEO) overconfidence and related over-optimism; besides, the authors also emphasized more the role of innovation in achieving success. The characteristics and abilities of CEOs affect the strategic decision making and reporting process. In accordance with recent literature, we used the emotional intelligence to explain the performance of companies. "Emotional intelligence as a cognitive ability affects an individual's decision making". In fact, cognitive bias, such as aversion to loss, optimism, and excess of confidence, makes a manager irrational.

Tan and Tan (2000) believe in the existence of a positive and significant relationship between satisfaction and trust with the supervisor, and innovative behavior. Hence, the CEO emotional intelligence is positively related to Research and Development (R&D) investment behavior, which is in its turn, positively related to CSR (Yew et al. 2006). The studies of Ouyang et al. (2015) showed the existence of a relationship between employment insurance and job satisfaction. Malik and Shahid (2016) have shown that emotional self-awareness is perfectly linked to being deeply embedded in emotions in order to understand them and thus to have emotional knowledge that would ultimately lead to the strength of the individual performance. At work, Asrar-ul-Haq et al. (2017) have shown that emotional self-awareness, self-confidence, success, the development of others, and conflict management have a positive and meaningful relationship with work performance. Using data from a questionnaire to calculate the emotional intelligence and CSR categories variables, we empirically tested our theoretical predictions that R&D is significantly associated with CSR categories. We also investigated the moderating role of CEO emotional intelligence attributes in the relation between R&D and CSR categories. Consistent with our predictions, we found that the studied behavioural finance could play the role of moderator between R&D and CSR categories. The results indicate that the independent variable has a positive and significant effect on CSR categories.

We extended our empirical analyses by a robustness test. We re-estimated regressions (1)–(5) using the "decision tree", as a new data analysis method, utilized to analyze our work. Before presenting our results, all the variables have to be discretized.

The remaining of this article is structured as follows: Section 2 provided an overview of New Standards for Corporate Social Responsibility of Tunisian companies section 3 reviewed the related literature and formulated the hypothesis; Section 4

described the research design while section 5 revealed the empirical results and discussed the study findings; Section 6 concluded the paper.

Tunisia: New Standards for Corporate Social Responsibility

Nowadays, CSR has become very important and indispensable for the success of any organization (Kirat, 2015). In Tunisia, and since 2005, "The adopted Global Compact comprises 10 principles which companies follow and commit themselves to voluntarily implement in order to control the inherent social and environmental risks of their activities. These principles are mainly concerned with the protection of human rights, Fundamental rights at work, the environment and the fight against corruption", (United Nations Global Compact, 2005). A socially responsible company follows the best practices and a set of values that create positive employer-employee relationships, as well as a positive working environment. The public also wants to buy, work, and collaborate with a company that has an ethical image, (Zeribi, 2012).

In mid-2010, the ISO 26000 standard defines CSR as an "Expression of the will to integrate the social and environmental considerations in the Company's decisions, to measure their progress, to be transparent and contribute to sustainable development".

After the revolution of January 14, 2011, the social, political and economic state in Tunisia has become very delicate. The political events took place between 2011 and 2016. In this period the situation of the major companies is critical. The unemployment rate published by the National Institute of Statistics (NIS) was 18.6% for the year 2010, this rate has increased to reach its maximum of 23.5% in first quarter of 2016 and then to decrease to 23.2% by the end of 2016. In the Tunisian context, Dekhili (2012) have identified four CSR strategies that are the business-versus-society strategy, the green washing strategy, the good citizen strategy and the CSR leadership strategy.

Theoretical literature review and hypothesis

Recent research based on agency (Jensen and Meckling, 1976), cognitive and behavioural governance (Charreaux, 2005) shows that the R&D investment affects CSR categories. In this context, a great deal of research has shifted to focus on the moderate effect of CEOs emotional intelligence on the relation between CSR and R&D investment.

The impact of R&D on CSR categories

Managerially speaking, several studies (Bender & Pigeyre, 2004) perceived the existence of a relationship between R&D and CSR in terms of customer satisfaction. Kochan et al. (2003) found that R&D enables the company to understand the requirements of its clients. With R&D; the firms attempt to develop or generate new service to answer a customer's needs and wants (Johnson et al., 2014). R&D is a resource in the pursuit of competitive advantage because using R&D can help maximize benefits for those customers, increase customer loyalty (Park & Nicolau, 2019), and increase performance and profitability (Zouari & Zouari-Hadiji, 2014).

Rubera and Kirca (2017) prove that the satisfaction effects from innovative efforts are a market-based asset available for the firm to improve performance. Thus, greater R&D expenditures that are weighty of better absorptive ability, superior knowledge management, and a greater reservoir of strategic assets should manifest in customers being more satisfied.

H1.a. R&D influences the customer satisfaction

The Theory of Resources and Skills, (Jackson et al., 2003) mentioned the existence of significant and positive impact of R&D on the effectiveness of the working

groups and employees of the organizations. Del Monte and Papigni, (2003) suppose that a good environment pushes employees to increase their productivity, which has a positive impact on the group performance. Managers in this case seek to fully engage themselves in activities that positively mirror their business. These activities may include R&D that has a significantly higher growth rate compared to companies that are not engaged in R&D. In addition, the ability of the company to manage its resources helps motivate, satisfy and increase the employees' productivity. The decision of the company is the reason for the agency costs and the conflicts of interest that may occur between the manager and the shareholder have a negative impact on the company's relationship with its various subordinates (Delmas & Pekovic, 2018).

H1.b. R&D affects the employee motivation.

Esty and Porter (2005) found that the environmental outcomes are not simply a function of economic development, but also a consequence of political choice. Recent research shows that R&D investment affects community performance. This research is based on agency theories, transaction costs; cognitive, behavioural finance. Cassiman et al. (2018) observe that the cooperation with suppliers and competitors has a significant impact on labor productivity growth, while cooperation with universities and research institutes positively affects productivity in innovative sales. The R&D collaboration networks can reduce the gap between the knowledge-intensive regions and catching-up regions (De Noni et al., 2018).

H1.c. R&D affects the community satisfaction.

The innovative firms are significantly more likely to have cooperated with their suppliers, customers, and universities, Freel (2000). Considering the inter-industry personal networks of entrepreneurs in Japan, Fukugawa (2006) reveals that the membership structure is of importance and cooperation with public research institutes has a positive impact on the technological success of innovation projects. Caloghirou et al. (2003) also reveal that the perceived success significantly depends on the closeness of the cooperative research to the in-house R&D effort of the firm, the firm's effort to learn from the partnership and its partners, and the absence of problems related to knowledge appropriation between partners (Subramanian et al., 2018).

H1.d. R&D affects the territory satisfaction.

Cole et al. (2005) revealed that R&D intensive firms more easily met environmental regulations and reduced pollution emissions by reaping the benefits of the most recent technological advancements. R&D investment has a significant negative impact on energy consumption and carbon emissions intensities (Alam et al., 2019). Tang and Tan (2013), scrutinize the influence of technological development on the consumption of electricity use in Malaysia. The research identifies that technological development helps reduce electricity consumption considerably by improving energy efficiency. In the same vein of thoughts, Lee and Min (2015) investigate the relationship between eco-innovation and CO₂ emissions reductions in Japanese manufacturing firms. The results show that eco-innovation helps to reduce carbon emissions significantly. Ahmed et al. (2016) examine the causal relationship between technological progress, biomass use, and CO₂ emissions in 24 European nations and reveal that technological progress has a substantial impact on minimising CO₂ emissions.

H1.e. R&D affects the environment

The moderate effect of CEOs emotional intelligence

Rode et al. (2007) point out the existence of a positive correlation between emotional intelligence and the efficiency of the choice of the investment horizon. Thalmann (2004) also believe that "Social skills are not enough; they must be accompanied by essential elements such as general knowledge of the organization and its goals as well as how to run meetings, the ability to delegate to the right people, the right sense, communication, planning, supervision, risk taking, innovation, etc. There is, therefore, an essential prerequisite to CEO: emotional intelligence that cannot be replaced". Aslam et al. (2018) proved that emotional intelligence helps entrepreneurial businesses to observe customer perception and future response to new offerings.

H2.a. CEOs emotional intelligence moderates the relation between R&D-Customer

Erkut and Yeliz (2015) mentioned that "CEOs mediates the establishment of more communication and cooperation between employees, and the creation of the spirit of teamwork". As a positive emotion, however, emotional intelligence should guide CEOs to make the wise decision to broaden the business scope of activity, minimize the business cooperation issues, innovate and achieve social performance in terms of CEO-employee relationship. Schutte et al. (2004) come to the fact that emotional intelligence is positively correlated with the CEO's effectiveness and that the CEO emotional intelligence is a good indicator of the performance of his business.

Analysts like Dhani and Sharma (2017) proposed that the organizations should implement emotional intelligence in recruiting and selecting employees as people with high emotional intelligence expect better performance in innovation companies. Huang (2013) thinks that the CSR related to the CEO socio-demographic characteristics such as the specialization of his higher qualifications, seniority, sex, level of emotional intelligence and cognitive skills. Goleman et al. (2000) ascertain that the CEO emotional intelligence enables him to foster the creative innovation for the sake of a global performance to motivate employees and build friendly relationships with them. Hence, we can now present the following hypothesis:

H2.b. CEOs emotional intelligence moderates the relation between R&D investment and employees

Jordan, Ashkanasy and Hartel (2002) consider the CEOs' emotional intelligence as a "moderator of the negative effects of stress. In other words; a socially successful company has a strong relation with community and the country in general. This assumption was revealed in the work of Mayer and Salovey (1997) who proved that there is a positive correlation between emotion management, emotion understanding and performance related to customer services. In contrast, Savoie and Brunet (2000) see that emotionally intelligent CEOs try to achieve social performance that is based on the quality of the group experience, personality and its relation with the customers, suppliers....

H2.c. CEOs emotional intelligence moderates the R&D-Community relationship

Hartmann and Perego (2005) believe that the strategies (R&D investment) adopted by companies are a threat to the environment; overconfident managers distribute lower cash profit if they need more investments in the future, because they believe that foreign financing is costly. They also concluded that this negative relationship is more intense in companies with lower growth opportunities and stringent cash resources, Deshmukh et al. (2018). Additionally, emotionally-intelligent

CEOs seek to increase their business-market value, which is positively related to the R&D investment (Bae & Kim, 2003). The CEOs have also to be keen on increasing their companies' growth opportunities based on R&D and to obtain a customer satisfaction as this has a positive effect on these opportunities (Yew et al. 2006).

H2.d. CEOs emotional intelligence moderates the R&D-Territory relationship

According to Delmas et al. (2018), the apprenticeship ability of a company can not only improve the environmental performance, but also gain a competitive advantage (cost control, reputation, innovation-differentiation), to increase the profit of the company by gaining a competitive advantage from its environmental programs and throughout the environmental impacts on its global reputation. After environmental turbulence, an emotionally intelligent manager seeks to stabilize the situation of the company and innovate to cope with the environmental changes. Baker and Sinkula (2002) showed that innovation allows a company to cope with environmental changes. CEOs face regulatory pressure to increase energy efficiency and reduce carbon emissions by stimulating innovation and R&D technology (Alam et al., 2019). Dhahri and Omri (2018) found a negative and statistically insignificant impact of human development on environmental degradation.

H2.e. CEOs emotional intelligence moderates the R&D-environment relation

Research design

This research was meant to provide insights on how CEOs emotional intelligence can moderate the relation between CSR categories (customer, employees, community, territory and environment) and R&D investment. Our methodology consists of two parts. The first is used to identify the data sample selection and the second is devoted to the model specification.

Figure 1. R&D Investment, CSR categories and CEOs emotional intelligence: A moderation model
Source: Authors' results.

Data sample selection

Our empirical study relied on a quantitative research. We used a questionnaire as a data collection method? 246 firms were approached using a questionnaire, where (152) responses were received and only (96) valid responses were entered for analysis (companies belonging to the financial sector are excluded (banks, insurance companies ...) because they have a unique financial structure).

Table 1. Sample distribution

Industry	N	%
Chemistry	5	5,2%
Distribution	2	2,083%
food processing	15	15,625%
Transportation	2	2,083%
Industries	15	15,625%
Computer	9	9,375%
Consumer services	31	32,291%
other consumer goods	3	3,125%
Buildings	2	2,083%
Total	96	100

Source: Authors' results.

Variables

CSR categories is the dependent variables, R&D was conceived as a set of independent variables; age, debt, and size are the controls variables

Table 2. Definition of variables

Variable	Definition	Measure	Authors
Dependent variables CSR categories			
CSR categories ¹	Corporate Social Responsibility categories	A score ranging from 0 (no item is taken into account) to a maximum of 28 (all items are considered).	Luo et al. (2015 ; EL Ghoul et al. (2017))
• CUS	Customer	A score ranging from 0 (no item is taken into account) to a maximum of 8	
• EMP	Employee	A score ranging from 0 (no item is taken into account) to a maximum of 8	
• COM	Community	A score ranging from 0 (no item is taken into account) to a maximum of 3	

¹ See appendix1

•	TER	Territory	A score ranging from 0 (no item is taken into account) to a maximum of 3	
•	ENV	Environment	A score ranging from 0 (no item is taken into account) to a maximum of 6	
Independent variables				
EI		Emotional Intelligence ²	Model of emotional intelligence developed by Golemen (2000) A score ranging from 0 (no item is taken into account) to a maximum of 17 items	Zeidner et al. (2004) Zouari-Hadiji et al (2022)
R&D		Research and Development	The ratio between R&D expense and salestotal	Chesbrough et al. (2006) Zouari and Zouari-Hadiji (2014),Konno and Itah (2018).
Control variables				
SIZE		Firm size	Log of firm’s total assets.	(Lopes, 2018).
DEBT		Firm leverage	(total debt / total assets) in percentage	Giroud and Mueller (2017).
AGE		Firm age	the logarithm of the number of working years	BenCheikh and Zarai (2008) and (Muttakin et al., 2017).

Source: Authors' results.

Correlation Matrix

The explanatory and control variables influence the CSR categories and verify its multidimensionality. They are also distinct from each other and exhibit, as shown in Tables 3, a low and /or non-significant correlation between them.

Table 3. Pearson correlations matrix

	CUS	EMP	COM	TER	ENV	R&D	EI	SIZE	AGE	DEBT
CUS	1									
EMP	0.2267	1								
COM	0.0295	0.0931	1							
TER	0.0142	0.0156	-0.0409	1						

² See appendix2

ENV	0.5245	0.0682	-0.0218	0.0121	1					
R&D	0.1734	0.0054	0.0668	-0.0334	0.0591	1				
EI	0.1854	0.1343	0.0617	0.0708	0.1586	0.0872	1			
SIZE	0.1249	0.0871	0.0812	0.0155	0.2956	0.0660	0.1958	1		
AGE	0.0035	0.0101	0.0408	0.0630	0.2171	0.1316	0.0040	0.1786	1	
DEBT	0.0254	0.0354	0.0654	0.0724	0.0213	0.0662	0.0654	0.0213	0.0215	1

Source: Authors' results

All variables are defined in appendix 2. All the estimates have been carried out using the partial least squares method. Note that all correlations between variables are significantly smaller than 0.6 (threshold at which we begin to experience serious problems of multi-collinearity). In the Pearson test and the index of conditioning we have found that these variables are distinct from each other and are not significant (correlation thresholds above 10% and the packaging is less than 1000).

Model specification

We tried to check the effect of R&D investment on customer satisfaction, employee motivation, community satisfaction, territory satisfaction and environment problems and the models to be tested were:

$$Customer = \beta_0 + \beta_1 R\&D + \beta_2 SIZE + \beta_3 AGE + \beta_4 DEBT + \varepsilon \quad (1)$$

$$Employees = \beta_0 + \beta_1 R\&D + \beta_2 SIZE + \beta_3 AGE + \beta_4 DEBT + \varepsilon \quad (2)$$

$$Community = \beta_0 + \beta_1 R\&D + \beta_2 SIZE + \beta_3 AGE + \beta_4 DEBT + \varepsilon \quad (3)$$

$$Territory = \beta_0 + \beta_1 R\&D + \beta_2 SIZE + \beta_3 AGE + \beta_4 DEBT + \varepsilon \quad (4)$$

$$Environment = \beta_0 + \beta_1 R\&D + \beta_2 SIZE + \beta_3 AGE + \beta_4 DEBT + \varepsilon \quad (5)$$

We tried to verify the moderating effect of CEOs emotional intelligence on the sensitivity of customer satisfaction, employee motivation, community satisfaction, territory satisfaction and environment problems toward R&D investment, we included an interaction effect to the previous analysis (Models 1,2,3,4 and 5). The models to be tested are:

$$Customer = \beta_0 + \beta_1 R\&D + \beta_2 EI + \beta_3 R\&D * EI + \beta_4 SIZE + \beta_5 AGE + \beta_6 DEBT + \varepsilon \quad (6)$$

$$Employees = \beta_0 + \beta_1 R\&D + \beta_2 EI + \beta_3 R\&D * EI + \beta_4 SIZE + \beta_5 AGE + \beta_6 DEBT + \varepsilon \quad (7)$$

$$Community = \beta_0 + \beta_1 R\&D + \beta_2 EI + \beta_3 R\&D * EI + \beta_4 SIZE + \beta_5 AGE + \beta_6 DEBT + \varepsilon \quad (8)$$

$$Territory = \beta_0 + \beta_1 R\&D + \beta_2 EI + \beta_3 R\&D * EI + \beta_4 SIZE + \beta_5 AGE + \beta_6 DEBT + \varepsilon \quad (9)$$

$$Environment = \beta_0 + \beta_1 R\&D + \beta_2 EI + \beta_3 R\&D * EI + \beta_4 SIZE + \beta_5 AGE + \beta_6 DEBT + \varepsilon \quad (10)$$

EI: Emotional Intelligence, and R&D: research and development. In our model, we included three control variables (firm size, debt, and age), which explain the level of business performance.

Results

Descriptive statistics

This part was dedicated to the presentation of the descriptive statistics related to: CSR categories, CEO emotional intelligence, R&D, the company size, the company age and the debts.

Table 4. Descriptive statistics

Variable	Mean	Min	Max	Std-dev
EI	65.2500	60.00	68.00	2.20526
CSR	.5145	.06	.94	.237964
R&D	.5803	.09	.99	.21715
AGE	1.4920	.3	1.91	.31502
SIZE	2.4545	.04	13.25	1.68914
DEBT	.4891	.02	1.00	.25370

Source: Authors' results.

Notes: CSR: Corporate Social Responsibility, EI: Emotional Intelligence, and R&D: research and development. In our model, we included three control variables approximated by the firm size, debt and age.

According to the above table, the results show that the R&D independent variable reached an average of 58, 03 % and became positively significant in the presence of high level CEO emotional intelligence. This finding can be backed by the findings of Aslam et al (2018) who insisted that “the emotional intelligence helps entrepreneurial businesses to observe the customer perception and future response of new offerings”. For the control variables, the sample companies, age, size and debt have a profitability of 1, 4920; 2, 4545 and 0, 4891.

Regression results and discussion

The impact of R&D on CSR categories was estimated and displayed in table5. The first model shows a positive and significant R&D-customer relationship ($\beta=0,746$ and $p<10\%$), and R&D-employee relationship ($\beta=0,534$ and $p<1\%$). R&D is significantly positively associated with community ($\beta=0,489$ and $p<10\%$), but significantly negatively associated with environment ($\beta=-0, 2892$ and $p<10\%$). These results provide continuous support for H1 a, b, c and e.

Table 5. R&D and CSR categories

Customer	Employees	Community	Territory	Environment
Model1	Model2	Model3	Model4	Model 5

	Coeff (t-statistic)	Coeff (t-statistic)	Coeff (t-statistic)	Coeff (t-statistic)	Coeff (t-statistic)
C	0.379(14.321) ***	0.206(16.521) ***	0.325(13.741) ***	0.965(18.08) ***	-0.385(-14.25)*
R&D	0.746(20.964) *	0.534(17.798) ***	0.489(14.992)*	0.069(1.159)	-0.0892 (-3.48)*
Size	0.005(5.181)*	0.025(4.181)*	0.010(3.20)*	0.023(4.152) **	0.019(4.153)*
AGE	0.084(2.859)*	0.079(3.624)*	0.183(4.81)*	0.178(2.245) **	0.064(3.245)*
DEBT	-0.006(-3.606)*	-0.005(-2.606)*	-0.057(-2.03)**	-0.002(3.245) **	-0.019(-4.287) **
R-Squared	0.456	0.543	0.254	0.145	0.146
N-obs	96	96	96	96	96

Source: Authors' results.

Notes: CSR categories calculated based on 28 items (Customer relationships, employee's relationships, community and territory relationships and environmental performance). R&D: research and development .Linear regression of five models with MCG method by SPSS17. *, **, ***, Respective significance at 10%, 5% and 1%.

To test H2, we referred to CEOs emotional intelligence to examine whether association between R&D and CSR categories (R&D*EI). The results displayed in table 6 indicate that the independent variable has a positive and significant effect on customers ($\beta=0,521$ and $p<10\%$), employees ($\beta=3,139$ and $p<5\%$), community ($\beta=0,781$ and $p<5\%$), territory ($\beta=0,375$ and $p<10\%$), and environment ($\beta=0,921$ and $p<10\%$), In Tunisian companies, if the emotional intelligence were given importance, R&D would be aware of this situation and CSR categories would be directly and positively affected. This result confirms the findings of Aslam et al. (2018), who emphasized that "the emotional intelligence helps entrepreneurial businesses to observe the customer perception and the future response of new offerings" (p.18).

As previously stated, indebtedness negatively and significantly affected the CSR categories, while the other control variables, such as age, debt were significant. However, size had a positive and significant effect at about 1%; i.e., the larger the company is, the higher its CSR categories will be. This result confirms the results of Delmas et al. (2011).

Table 6.The moderating role of CEOs emotional intelligence

	Customer	Employees	Community	Territory	Environment
	Model6	Model7	Model8	Model9	Model 10
	Coeff (t-statistic)	Coeff (t-statistic)	Coeff (t-statistic)	Coeff (t-statistic)	Coeff (t-statistic)
C	0.325(14.321) ***	0.358(13.521) ***	32.286(7.54) ***	0.156(13.458) ***	0.456(9.002) ***
R&D	0.746 (1.964) *	0.534(7.798) ***	0.781(2.57) **	0.912(2.99) **	0.058(4.995) **
EI	0.425(8.569) ***	0.013(2.08) **	0.009(1.81)*	3.825(3.05) ***	0.723(9.258) **
R&D*EI	0.521(9.565) ***	3.139(2.45) **	0.781(2.57) **	0.375(13.824)*	0.921(10.560)*
Size	0.012(3.168) ***	0.01 (2.93) ***	0.008(2.57) ***	0.012(2.87) ***	0.068(4.035)*
AGE	0.084(2.859)	0.053(3.246)	0.001(1.968)	0.599(1.568)*	0.082(3.487)*
DEBT	-0.006(-3.606)*	-0.005(-2.606)*	-0.185(-5.323) ***	-0.248(-5.489)*	-0.038(-5.214)*
R-Squared	0.326	0.543	0.498	0.324	0.256
N-obs	96	96	96	96	96

Source: Authors' results.

Notes: CSR categories calculated based on 28 items (Customer relationships, employee's relationships, community and territory relationships and environmental performance). Emotional intelligence divided into 7 factors .The responding managers used a 5-point scale, from "no agreement" to «total agreement". EI: Emotional Intelligence, R&D: research and development Linear regression of four models with MCG method by SPSS17. *, **, ***, Respective significance at 10%, 5% and 1%

The main question of this paper was: how the CEO emotional intelligence moderates the CSR-R&D sensitivity? This study validates our hypothesis. This can be explained by the fact that the emotionally intelligent CEOs decide to invest in R&D, which, in turn, allows creating some opportunities (Alam et al., 2019). A CEO with a high level of emotional intelligence chooses liable strategies to solve the most complex tasks relying on his inter-interpersonal confidence. The CEO here is interested in developing new studies, ideas and in R&D, which affects the business performance (Yew et al. 2006).

The validation of this hypothesis confirms the results found by Colombo et al. (2012), Parida et al. (2012), who claim that the R&D investment has a positive impact on any innovative company as this investment is used to establish a good reputation vis-à-vis the shareholders and investors; it is the aim of any CEO's emotional intelligence.

In this respective, an emotionally intelligent CEO should try to foster a positive work environment for the different stakeholders. This helps them to increase their productivity and, in turn, to increase the business market value which is positively related to R&D investment (Bae & Kim 2003). As a matter of fact, the obtained results are in line with the study of Delmas et al. (2011) who state that the emotional intelligence of a given company helps us not only to improve the CSR categories, but also to obtain a competitive advantage (cost control, reputation, and innovation-differentiation). Additionally, we can increase the profit of the company by taking a competitive advantage of its environmental programs, the relations with the stakeholders (shareholders, the local community, government, customers and suppliers) and through the environmental impact on its global reputation. Indebtedness, however, negatively and significantly affects the CSR categories.

Robustness test

To check the robustness of our main results, we checked the moderating role of CEO emotional intelligence, and therefore re-estimated the regressions (1)-(5) using the "decision tree" as a new data analysis method. Before presenting our results, all the variables must be discretized; the following table summarizes this transformation:

Table7. Discretized variables

variables	Type	Classification
CSR categories	Discretized [1 : low ; 2 :medium ; 3 : high level]	1 if CSR<0,5 2 if CSR=0,5 3 if CSR>0,5
Emotionnel Intelligence	Discretized [0 :low; 1 : highlevel]	0 if EI < 30 1 if EI >30
Research and development	Discretized [1 :low ; 2 :medium ; 3 :high level]	1 if R&D<0,5 2 if R&D=0,5 3 if R&D >0,5
Debt	Discretized [0 : low ; 1 : highlevel]	0 if Debt<0,5 1 if Debt>0,5
Age	Discretized [0 : not aged ; 1 :aged]	0 if age<15 1 if age >15

Size

Discretized [1 : small ; 2 : medium ; 3 : large]
 1 if Ln (CA) <3
 2 if Ln (CA) ∈ [4 ; 10]
 3 if Ln(CA)>10

Source: Authors' results.

The moderating effect of CEOs emotional intelligence on the sensitivity of customer satisfaction, employee motivation, community satisfaction, territory satisfaction and environment problems to investment in R&D is summarized in figures 2, 3, 4, 5, and 6.

Figure 2. Decision Tree of moderating effect of CEOs emotional intelligence on R&D and customers relation.

Source: Authors' results.

“Emotional intelligence” is the most important variable that affects the relation between customer satisfaction and R&D sensitivity. This is a binary segmentation variable. (1: high level of emotional intelligence; 0: low level of emotional intelligence), it produces 2 sub-summits. The frequency distribution shows that emotional intelligence is correlated with a high level of customer satisfaction ($p = 0.448$).

Figure 3. Decision Tree of moderating effect of CEOs emotional intelligence on R&D and employee relation.

Source: Authors' results.

The first edge (branch) on the right of the second level is produced from the modality "1". The resulting summit covers 3 observations "1: low; 2: Medium; 3: high". This distribution shows that the CEOs emotional intelligence is correlated with the R&D*employee motivation. This is explained by the fact that the CEOs with a high level of emotional intelligence should be able to achieve good relations among the work-group members by trying to take the initiative to expand the company-coverage field.

Figure 4. Decision Tree of moderating effect of CEOs emotional intelligence on R&D and community relation.

Source: Authors' results.

"Emotional intelligence" is the first used variable. It is the most important variable that explains the R&D-community satisfaction relationship.

Figure 5. Decision Tree of moderating effect of CEOs emotional intelligence on R&D and territory relation.

Source: Authors' results.

This distribution indicates that the CEOs with a low level of emotional intelligence is positively correlated with the relationship between R&D-territory.

Figure 6. Decision Tree of moderating effect of CEOs emotional intelligence on R&D and environment relation.

Source: Authors' results

It is worth reminding that "Emotional intelligence" is the first used variable as it seems to be the most important one to explain the relationship between R&D and environment problems.

Conclusion

As one of the strategies used by managers to dominate others firms, to increase their market share and improve their performance, innovation has been very effective in corporate organizations in Tunisia.

This study offered a new and integrated theoretical framework to examine the crucial role of CEOs emotional intelligence to explain the interaction relationship between R&D and CSR categories (customer, employees, community, territory and environment). With the development of research, R&D offers a good opportunity for the improvement of CSR categories enterprise. Nevertheless, there are many difficulties in the perfection of R&D and its application. In this research, we expected that the CEOs emotional intelligence would positively moderate the relation between R&D investment and CSR categories. The results demonstrate that R&D investment affects positively CSR categories. We also indicated that CEOs emotional intelligence moderate the relation between CSR categories and R&D investment.

The intriguing results in this study create a dilemma facing international managers: the findings of this study support Tunisian enterprises efforts to implement investments in R&D. As a result, Tunisian enterprises CEOs have to face a trade-off: whether they should focus on more R&D investment in order to enhance their capability to satisfy the CSR categories. Therefore, managers should focus on introducing innovation strategy to solve the problem of trust among organizations, such as the nodes with interest conflicts or competing relationship. Secondly, firms should wage more attention to run professional and intelligent enterprise services relying on R&D.

The limitations of this research could be summed up in the difficulty in obtaining responses from CEOs. However, our study opens interesting future horizons. First, we can investigate the CSR-financial performance sensitivity and the moderating role of overconfidence. Second, we can even examine the relation between the agency costs and CSR categories relying on the presence of other behavioural variables.

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Appendix 1. CSR categories

Items	Employees motivation	Customers satisfaction	Community satisfaction	Territory satisfaction	Environments
We put child-care centers	,986				

A 3-month-high-production bonus for most employees	,986				
Ensure transport for employees	,937				
Ensure trainings for my employees	,919				
Ensure the medical coverage for all my employees	,905				
a canteen is set up in my business	,847				
the provision of an infirmary with a doctor available on-site during all work-hours	,964				
They have the right to strike	,945				
Providing quality service		,929			
ensure that the product sold is in line with what has been previously negotiated		,914			
free delivery		,876			
ensure a high quality of commercial relations between the customer and the company's interlocutors		,982			
ensure that the sales process is optimal and effective		,940			
offer additional products		,939			
Minimizing waiting time		,934			
Proliferation of the products offered		,985			
I contribute to the financing of the infrastructure in my area			,985		
I participate in the cultural activities within my business			,907		
I assure the funding of schools and mosques in my city			,862		
I participate in local associations				,789	
I suggest trainings for employees of companies in difficulty				,703	
I help small and new businesses to get them on their feet in the Tunisian market				,804	
I choose energy sources that protect the environment					,929
I choose low-cost means of transport					,928
I apply the highest standards of environmental standards					,919
I make an energy saving plan					,916
I recycle my products					,899
The raw materials chosen by our company limit the depletion of natural resources					,446

Appendix 2. Emotional intelligence factors

Items	Factor1 Personal awareness	Factor2 empathy	Factor3 personal management	Factor4 Report management	Factor5 emotional awareness	Factor6 Motivation	Factor7 Relation management
My colleagues are not communicative	,914						
I do things that I regret	,853						
I communicate well with each of my co-workers	-,841						
It is unpredictable how my colleagues feel in any given situation		-,931					
I can interpret no verbal messages		,906					
I can describe exactly what I feel		,575					
I can stay calm even in difficult circumstances			,786				
The things that happen in my life are meaningful for me			,774				
I appreciate other people's feedback			,532				
I feel excited when I think of my goals				-,683			
I get impatient with incompetent people				,678			
I'm influenced by other people's opinions				,561			
I can explain my action					,777		
I comfortably talk to anyone					,687		
I imagine that the corporate performance will be good						,870	
Others do not see me as I see myself							,764
I am aware enough to achieve my future goals						,4	