

The Relationship between Managers' Narcissism and Investment in Research and Development

Diego A. Soledad*, Armando Terriera

Dept. of management, Faculty of Economics and Management, Lisbon University

Abstract

Narcissism refers to a personality that has high self-esteem, need for attention, sense of personal superiority, low social empathy, and a greater desire to use other people's skills. The present research aims to relate managers' narcissism with investment in research and development based on the moderating role of corporate social responsibility performance. In terms of purpose, the research is an applied and correlational type of research. In this regard, 132 companies were selected as sample member companies that were active in the Lisbon Stock Exchange during 2019-2020. The research data was collected from the real financial statements of the companies through the Codal website and compiled using Excel software. The method of hypothesis testing is multivariate regression using Eviews 12 statistical software. The findings show that managers' narcissism has no significant relationship with investment in research and development. The performance of corporate social responsibility has a statistically significant relationship with investment in research and development, and the performance of corporate social responsibility does not have a moderating role on the relationship between managers' narcissism and investment in research and development. The results of this research add to the development of literature related to managers' narcissism and investment in research and development. This research shows evidence that narcissism is not an influential characteristic for investment in research and development, unlike other studies that consider narcissism as a negative characteristic for investment in research and development because the desire to be praised by shareholders makes managers less likely to research and develop.

Key words

Managers' narcissism, Corporate social responsibility performance, Investment in research and development

[Original article](#)

Corresponding author: diego.soledad.a@gmail.com

Received:
10 Oct 2022
Accept:
11 Nov 2022

Introduction

Narcissism refers to a personality with high self-esteem, need for attention, sense of personal superiority, low social empathy, and a greater desire to use other people's skills (1). Narcissism is a personality structure

that has received a huge amount of experimental studies from the perspective of social, personality and clinical psychology. The concept of narcissism refers to people's need for fame, admiration and making themselves look great in the eyes of others. In Portugal, it

seems that many professionals, especially those in managerial positions, exhibit narcissistic behaviors, but there is insufficient scientific research on the prevalence of such behavior among managers and it may be associated with problems. Complex strategic decisions of companies are mainly the result of managers' behavioral factors (2). Manager narcissism, which is a fascinating phenomenon, affects the firm's strategic options, and several studies have investigated its effects on firm decisions and organizational outcomes. Firms led by narcissistic managers do not achieve extensive achievement, R&D, corporate innovation, and sustainability performance (3). The relationship between psychological personality of managers and research and development remains unknown (4). This issue shows that research at high levels should identify the variables involved in order to better explain the direction of this relationship. Previous research on the effects of manager narcissism on company-level results faced challenges at different levels. These studies mostly focus on finding empirical evidence of a direct relationship, and therefore cannot theorize plausible mechanisms between manager narcissism and organizational outcomes. Undoubtedly, the declaration of corporate social responsibility and other activities of the accounting field still suffer from ambiguous ethical behavior. Narcissistic CEOs tend to have more narcissism in their senior management teams. A senior management team characterized by narcissism can benefit from the positive aspects of narcissism while avoiding its pitfalls, especially when the pace of strategic decision-making is slower and behavioral integrity is higher (5).

A researcher states that CEOs should choose the most efficient work-solving strategies by focusing on their potential characteristics, interpersonal and intrapersonal trust to encourage the development of new studies, new ideas, and research and development that affect work performance (6). Researchers believe that there is a positive and significant relationship between satisfaction and trust with the supervisor on the one hand and innovative behavior on the other hand (7). Therefore, the ethical behaviors of CEOs related to research and development costs was a behavior that affects the performance of corporate social responsibility (8). CEOs are implementing inefficient investment

policies that lead to lower quality acquisitions and increased risk. However, they also invest more in innovation and achieve greater innovation success (9). In fact, CEOs should perform well to improve corporate social responsibility performance in an effort to build a good reputation with shareholders as well as investors. Managers always try to satisfy the needs of different stakeholders because this demand makes companies engage in innovation. Demand allows to integrate the motivational role of the group of stakeholders, suppliers or even employees (10). The social responsibility of the company with the personal and sociological characteristics of senior managers such as; Exceptions are related to superior characteristics, seniority, gender, and cognitive skills (11). The institutionalization of corporate social responsibility in emerging countries through internal factors (approach to doing business or culture), and perhaps even through external factors (market conditions, government regulations and consumer awareness), is not predetermined. It proves the social of companies in developing countries (12). Cooperation with suppliers and competitors of the organization has a significant effect on the growth of the company's profitability, while cooperation with universities and research institutions has a positive effect on profitability and innovative sales (13). The cooperation of development and research networks can reduce the gap between knowledge-oriented regions and regions that seek excellence (14). Research and development plays a vital role in the innovation of companies and represents an important criterion for increasing the stock of knowledge in companies, which causes innovation and growth of companies (15).

Strategic decisions of companies come from cognitive biases and personality traits of managers. CEO narcissism, an executive psychological personality, cannot directly increase firm-level results if it is not related to organization-level activities. For example, researchers suggest corporate governance as a mediating link between CEO narcissism and organizational results (16). Also, accounting research shows that CEO narcissistic tendencies are likely to increase accounting performance measures by engaging in real activities, such as increasing production and sales (17). increase in order to gain more fame and be admired by investors (18). There is no theoretical and empirical research on the

relationship between managers' psychological personality, social responsibility activities and company performance (19). CEO narcissism can expand corporate social responsibility initiatives with assertiveness and consistency. Social responsibility involves long-term interaction projects, and therefore the benefits of social responsibility activities appear during a long process (20). In a research on the interactive effect of research and development costs on the relationship between environmental performance and financial performance of listed companies, their results show that there is no significant relationship between environmental performance and profit per share in the current year, but between environmental performance and profit per share in the current year. In the future, there is a positive and meaningful relationship, and environmental costs also help all stakeholders and users to evaluate the extent of companies' attention to research and development and environmental issues. Studies show that managers' narcissism has a positive and significant effect on social performance in the internal and external spheres. Narcissistic managers participate in social activities in order to show off and attract the attention of internal and external stakeholders, and overconfidence has a negative and significant effect on the relationship between managers' narcissism and internal and external social performance, and managers' false self-confidence leads to a decrease in the positive effect of manager's narcissism on social performance.

In a study, researchers found that there is a positive and significant relationship between the ownership of family companies and investment in research and development, and the psychological characteristics of managers have a positive and significant effect on the relationship between the ownership of family companies and investment in research and development (21). Also, in a research, it was shown that more confident managers spend more financial resources on company research and development than rational managers, and this behavioral characteristic has a positive effect on the company's research and development expenditures (22). In a research, it was shown that the voluntary disclosure of financial reports of companies is influenced by the narcissism of company managers, which statistically has a negative and significant relationship, and it was concluded that the personality

characteristics of narcissistic managers lead them to perform actions against the norm and cause them to follow attention and praise of others and this action will ultimately affect the performance of companies. In a study, researchers investigated the relationships between CEO narcissism, debt financing, and firm innovation performance: sentiment recognition using advanced artificial intelligence. The results show that the CEO's narcissism has a significant positive effect on the company's innovation performance. Debt financing plays a mediating role in the relationship between CEO narcissism and firm innovation performance. CEO narcissism can have a positive effect on firm's innovation performance through debt financing. Compared to non-state companies, CEO narcissism of state-owned companies has a more significant positive effect on debt financing and firm innovation performance (23). In a study, researchers investigated environmental regulations and investment in research and development in Chinese companies. Their results show the impact of environmental regulations on investment in research and development, and a significant increase in investment in research and development of companies after the approval of environmental regulations has been reported. 24).

The researchers investigate the state of corporate social responsibility during the spread of the Corona virus disease in recent years, and this research expresses new perspectives on corporate social responsibility for crisis management in special circumstances, and their results showed that there is a need to modify and implement reporting standards related to social responsibility. is a company and according to the social distancing caused by the Corona epidemic, the responsibility of companies goes to a new level, one of the most extensive manifestations of corporate social responsibility is the transition of entrepreneurship to remote activity, this creates remote employment for workers and online purchase of goods and Considers services for consumers (12). In a research to investigate managers' narcissism and company value: the mediating role of corporate social responsibility in the South Korean environment, they concluded that manager narcissism expands corporate social responsibility initiatives and corporate social responsibility increases the company's value in the capital market. However, the results do not

provide evidence that corporate social responsibility is caused by the relationship between manager narcissism and favorable organizational results (25). In a study, researchers have studied managerial emotional intelligence, research and development, and social responsibility performance. Their results showed that the top executive managers of Tunisian companies are faced with a trade-off whether they should improve their ability to realize the social responsibility performance of the organization with more research and development investment. Therefore, the managers of the organization should solve the problem of trusting among organizations by focusing on a variety of strategies, which are caused by things like knots created by conflict of interests and competitive relationship (26). According to what was said above, knowing the narcissism of managers can help the readers of this article to have a better understanding of the relationship between narcissism of managers and investment in research and development, so the main question is what is the relationship between narcissism of managers

and investment in research. And is there development with a moderating role of corporate social responsibility? The purpose of this research is primarily to expand the theoretical foundations of ethical studies in the field of accounting. Therefore, it is expected that this article can provide the necessary scientific achievement for behavioral finance research in the field of ethical decisions for investors, managers, researchers and policy makers in the field of accounting.

The hypotheses of this research are as follows:

Hypothesis 1: Managers' narcissism is related to investment in research and development.

Hypothesis 2: Corporate social responsibility performance is related to investment in research and development.

Hypothesis 3: Corporate social responsibility performance moderates the relationship between managers' narcissism and investment in research and development.

Based on the research hypotheses, the conceptual model of the research is as follows:

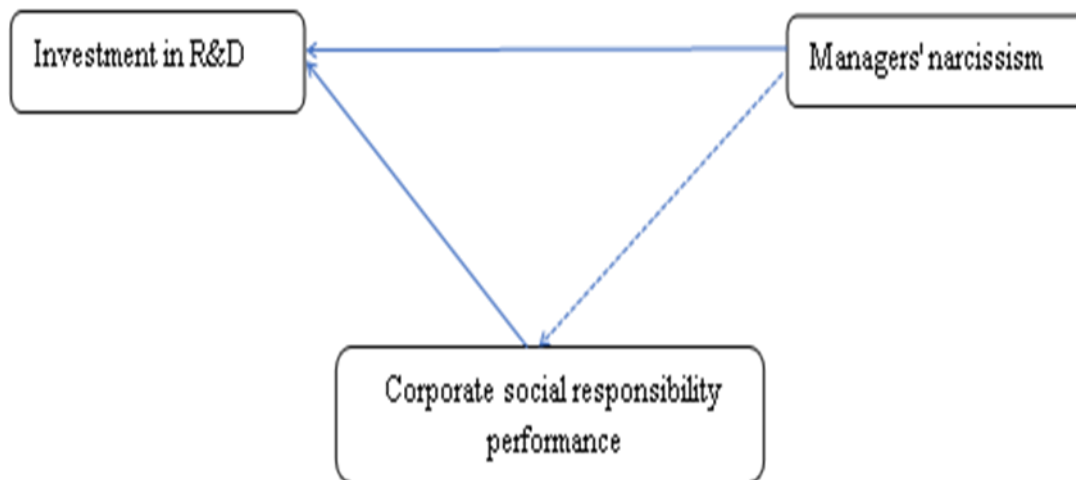


Figure1: Conceptual model of research

Research Methodology

This research is practical according to the purpose or result of the research, and the research method according to its subject is descriptive-correlation research, and also the present research was a quantitative and archival research in terms of the type of data,

and in order to obtain the required information, to process the research hypotheses from The financial statements of companies admitted to the Lisbon Stock Exchange will be used. Also, the research data was collected from the Codal site and compiled using Excel software. The method of testing the hypotheses is multivariate regression and in the present study using the statistical software Eview 12. The statistical population of the research includes companies that are listed on

the Lisbon Stock Exchange during the period of 2009 to 2019. To select the sample, things such as: the availability of financial information in order to extract the required data, their acceptance before 2013, absence of presence in the financial industry, investment, insurance, trading of shares in all research periods have

been considered. In this regard, 132 companies were selected as sample member companies.

Findings

The research variables and their measurement methods are as follows:

Table 1: How to calculate research variables

Variables	Calculation method
Investment in R&D	The ratio of research and development costs to total sales (27).
Manager's narcissism	Normally, in organizations, narcissistic executives give more rewards to themselves and thus strengthen their position in the organization (17). The cash bonus index of managers will be obtained by dividing the cash bonus approved in the general assembly meeting by the total salary and wages paid for the company's financial year (27).
CRP	To measure it according to table (2), the checklist of corporate social responsibility disclosure in Portugal is used. This checklist consists of 17 components and 60 types of information related to social responsibility disclosure. If one element of corporate social responsibility disclosure has been made, for that the corresponding value is considered zero otherwise. Therefore, the number of disclosed items to the total items that can be disclosed in the corporate social responsibility report represents the percentage of corporate social responsibility disclosure to determine its level in each company.
Size of company	The logarithm of total assets at the end of the period is used to measure the size.
Sale growth	Sales growth is obtained by calculating the difference between the current year's sales and the previous year's sales divided by the previous year's sales.
Financial leverage	The financial leverage of the company is equal to dividing the liabilities by the total assets of the company at the end of the financial period
Cash flow ratio	This ratio is obtained by calculating the cash flows divided by the total assets
Cash holding	This ratio is obtained by dividing the sum of cash and short-term investments by assets.

Table 2: Checklist of disclosure of information related to corporate social responsibility

Factor dimensions	Description
-------------------	-------------

Economical dimension	Economic performance, Presence in the market and region, Other economic activities, Responsible investment, Tax
Social dimension	Work and employees, Human rights, Supply chain, Community participation and development, Business ethics, Corruption and money laundering, Adhering to laws and regulations related to the social dimension
Environmental dimension	Raw materials and energy, diversity of biological species, gas emissions and waste, products and their environmental effects, compliance with environmental laws and regulations

Table (3) shows the descriptive statistics of the data related to the variables used in the research. The de-

scriptive statistics are related to 132 companies admitted to the Lisbon Stock Exchange during the period (2011 to 2019).

Table (3) descriptive statistics of research variables

Variable	Sale growth	Size of company	Cash holding	Financial leverage
Mean	0.320359	14.50041	0.077073	0.531422
Median	0.230508	14.32269	0.042281	0.543867
Max.	7.815542	20.76869	0.727417	0.996715
Min.	-0.931048	10.35211	0.000225	0.012733
SD	0.536296	1.556247	0.093169	0.194514
Skewness	4.751457	0.789673	2.439658	-0.290168
kurtosis	51.79453	4.238829	10.22563	2.549696
Observations	1320	1320	1320	1320
	Manager's narcissistic	Ratio of cash flow	CRP	Investment in R&D
Mean	0.436636	0.126044	0.137765	0.000670
Median	0.161736	0.107014	0.150000	0
Max.	25.52570	0.726654	0.300000	0.087331
Min.	0	-0.311045	0.000	0
SD	1.390793	0.143474	0.074317	0.004221
Skewness	10.90623	-0.287413	0.141229	10.90623
Kurtosis	1.569253	11.28096	2.152107	1.569253
Observations	1320	1320	1320	1320

Examining the significance of the variables: The significance of the variables in this research is shown

based on the Dickey-Fuller test in the form of the following table:

Table 4: Significant test of research variables

Variable	Order of difference	Sig.	Test statistic
Cash flow ratio	No difference	0.0000	-13.48194
Cash holding	No difference	0.0000	-15.98694

Financial leverage	No difference	0.0000	-13.55524
Sale growth	No difference	0.0000	-37.63144
Size of company	No difference	0.0000	-8.109550
Manager's narcissistic	No difference	0.0000	-8.469430
R&D	No difference	0.0000	-14.70208
CSR	No difference	0.0000	-7.750251

The results of the research model test: The results of the research model estimation are as described in table (5).

Table (5) statistical results of the research model test

Variables	Coefficient	SD	t-value	Sig.	Result
Fixed coefficient	-0.565627	0.162596	3.478716	0.0070	-
Manager's narcissism	0.472578	0.635589	0.743528	0.4761	Positive
CRP	0.066194	0.010754	6.155273	0.0002	Positive and sig.
CRP*MN	0.718854	4.394313	0.163587	0.8737	positive
Size of company	0.032242	0.45365	0.710719	0.4953	positive
Financial force	0.61678	0.021772	2.832934	0.0196	Positive and sig.
Ratio of cash flow	0.033528	0.016732	2.003818	0.0761	Positive and sig.
Increase of sale	0.003616	0.007028	0.372275	0.7183	positive
Cash holding	-0.081472	0.024392	-3.340174	0.0087	Negative and sig.
R ²	0.766267				
R ² adjusted	0.738069				
F-value	27.17374				

Table 6: Other statistics

Test	Amount	Sig.	Result
Limer	18.599415	0.000	The width from the origin is not equal in all sections
Homogeneity of variances	0.531675	0.8828	There is no heterogeneity of variance between errors
Hausman	4.343807	0.9588	The random effects method is appropriate
Durbin-Watson	1.519168	-	There is no autocorrelation

In checking the significance of all models, according to table (5), the probability value of F statistic is smaller than 0.05, the significance of the whole model

is confirmed with 95% certainty. The coefficient of determination and the adjusted coefficient of determination of the model are equal to 0.766267 and 0.738069,

which indicates that about 74% of the dependent variable of investment in research and development is explained by the independent and control variables of the model. In this research, to check the existence of collinearity between the variables of the model, the variance inflation factor statistic was used, and the results show that there is no collinearity between the variables, and according to table (6) in order to check the heterogeneity of the variance, after performing the test, it can be stated in the heterogeneity model There is no variance between the errors, in other words, the models do not suffer from the problem of variance heterogeneity. The Durbin-Watson statistic in the model is equal to (1.519168), which most likely rejects the assumption of autocorrelation. Next, the determination of the method of using panel data is examined, by examining the results obtained from the model, it can be said that the results of Limer's test indicate the selection of panel data, but the results of Hausman's test in the model indicate the acceptance of random effects.

First hypothesis: Managers' narcissism is related to investment in research and development.

According to table (5), the t-statistic of the research and development costs variable is equal to 0.743528, and its significance level is also 0.4761, which can be concluded that the significance level of this variable is greater than the 5% error (95% confidence level); Therefore, it can be concluded that managers' narcissism has no statistically significant relationship with investment in research and development.

Second hypothesis: Corporate social responsibility performance is related to investment in research and development. According to table (5), the t-statistic of the social responsibility performance variable of the company is equal to 6.155273, and its significance level is also 0.0002, which can be concluded that the significance level of this variable is less than 5% error (95% confidence level); Therefore, it can be concluded that the company's social responsibility performance has a statistically significant relationship with investment in research and development. Also, the coefficient of this variable is equal to 0.066194, which indicates a positive relationship; Therefore, the second hypothesis is confirmed.

Third hypothesis: Corporate social responsibility performance moderates the relationship between managers' narcissism and investment in research and development.

According to table (5), the t-statistic of the variable of managers' narcissism and the company's social responsibility performance is equal to 0.163587, and its significance level is also 0.8737, which can be concluded that the significance level of this variable is more than 5% error (95% confidence level). is; Therefore, it can be concluded that the performance of the company's social responsibility does not statistically moderate the relationship between managers' narcissism and investment in research and development.

Also, among the control variables of financial leverage, the ratio of cash flows has a positive and significant relationship with investment in research and development, and the variables of company size and sales growth have a positive relationship, but the variables of cash retention have a negative and significant relationship with investment in research and development.

Discussion

This study investigated the role of corporate social responsibility as a moderating variable between managers' narcissistic tendencies on R&D investment. Also, the current research contributes to the narcissism literature through its attempt to integrate the psychological personality of managers at the individual level and the performance of the company at the organizational level. According to the first hypothesis, managers' narcissism has no significant relationship with investment in research and development, and the results of the second hypothesis showed that the performance of corporate social responsibility has a positive and significant relationship with investment in research and development. According to the third hypothesis, the performance of corporate social responsibility has a moderating role on the relationship of managers' narcissism. It does not have to invest in research and development. Reviewing existing research that has examined the antecedents and outcomes of CSR with a focus on the psychological personality of leaders from a top-level perspective, very few studies examine how CEO narcissism affects R&D investment through CSR initiatives. has been Researchers show

that manager narcissism expands corporate social responsibility initiative and corporate social responsibility increases the value of the company in the capital market (24). In another study, it was shown that the CEO's narcissism has a significant positive effect on the company's innovation performance (22). The result of another study that shows a direct and meaningful relationship between managers' narcissism and social responsibility and also, the moderating role of managers' narcissism in explaining the relationship between social responsibility and financial performance was confirmed. In order to obtain material and spiritual benefits (such as increasing rewards and improving reputation in society), narcissistic managers spend in the company in line with their social responsibility, so that in the short term it seems that it will increase the value of the company, and it can be concluded that controlling the narcissism of managers It seems necessary and it is suggested that investors and other real and legal stakeholders take this into consideration when making decisions (27). This study uses indirect measures of managers' narcissism, which limits the sample. Future research could consider a more direct measurement of narcissism such as the Narcissistic Personality Questionnaire. This study focused on narcissism, one of the important dimensions of managers' psychological personality, future research can consider other dimensions of managers' psychological biases, such as prideful tendencies and focused supervision. Since the board of directors influences the CEO's decision, it is suggested that the personality characteristics of the board of directors should also be examined as moderators.

Conclusion

Recently, researchers have started research on the influence of managers' personality on the company's future, which is like a black box. Analyzing the effect of demographic characteristics of managers on the company's strategic decisions, such as investing in research and development, is of interest to many researchers. We have contributed to the theoretical literature of narcissism by examining the relationship between managers' narcissism and investment in research and development. While some studies only re-

flect the direct effect of narcissism, we have addressed this issue by examining the moderating role of corporate social responsibility. The results show that narcissistic CEOs do not make the expected investment in research and development, so the company's research and development does not reach its expected value. Therefore, this study provides evidence that narcissism is not an influential characteristic for investment in research and development, unlike other studies that consider narcissism as a negative characteristic for investment in research and development. Because the desire to be praised and admired by shareholders makes narcissistic CEOs believe in the artificial increase of current income due to their short-term perspective and do not pay attention to research and development. Although we conducted the study in Portugal, our findings can be generalized to developed markets because the meta-analysis of narcissism did not reveal any cross-country or cultural differences in relation to narcissism and its outcomes. Given that emerging markets suffer from regulatory gaps, unlike developed markets where investors' rights are protected, the effect of managers' narcissism can be even stronger in developed markets. Usually, narcissistic managers impress the board because of their positive qualities, such as high self-confidence, persuasiveness and charisma, and demonstrating their skills during the interview. Therefore, narcissistic managers should be guided to use the positive aspects of their characteristics and avoid self-centered activities. Effective presence of board members reduces the adverse effect of CEO narcissism. The positive role of corporate social responsibility performance helps in shaping research and development activities, and its implications can be useful for policy makers for regulatory actions as determinants of corporate social responsibility performance. Companies that consider social responsibility as important show sensitivity to stakeholders' expectations and move from fragmented and unstable procedures to stable and long-term strategies and pay more attention to the implementation of professional and intelligent services based on research and development.

References

1. Agnihotri A, Bhattacharya S. (2021). CEO narcissism and myopic management. *Industrial Marketing Management*; 97:145-158
2. Arena C, Michelon G, Trojanowski G. (2018). Big egos can be green: A study of CEO hubris and environmental innovation. *British Journal of Management*; 29: 316–336.
3. Cho K, Cho S, Lee J. (2019). Managerial attributes, consumer proximity, and corporate environmental performance. *Corporate Social Responsibility and Environmental Management*; 26: 159–169.
4. Capalbo F, Frino A, Lim M, Mollica A, Palumbo R. (2017). The impact of CEO narcissism on earnings management. *Abacus*; 54: 210–226.
5. Bachrach D, Yong kim K, Patel P, Harms P. (2022). Birds of a feather? Firm sales growth and narcissism in the upper echelons at the CEO-TMT interface. *The Leadership Quarterly*; 33(4):1-54
6. Wood I. (2001). Remote purchase environments: the influence of return policy leniency on two-stage decision processes. *Journal of Marketing Research*; 38(2):157-169.
7. Tan H, Tan C. (2000). Toward the differentiation of trust in supervisor and trust in organization. *Genetic, Social, and General Psychology Monographs*; 126(2): 241–260.
8. Yew K, Mira T, Chee M. (2006). Size, leverage, concentration and R&D investment in generating growth opportunities. *The Journal of Business*; 79(2): 851-876.
9. Banerjee R, Hitoshi M. (2018). The impact of liquidity regulation on banks. *Journal of Financial Intermediation*; 35: 30-40.
10. Gallaud D, Nayaradou M. (2012). Open innovation and cooperation: which choice of means of protection for innovation? *Journal of Innovation Economics & Management*; 2:167-190.
11. Huang S. (2013). The impact of CEO characteristics on corporate sustainable development. *Corporate Social Responsibility and Environmental Management*; 20(4):234–244.
12. Popkova E, Delo P, Bruno S. (2021). Corporate Social Responsibility Amid Social Distancing During the COVID-19 Crisis: BRICS vs. OECD Countries. *Research in International Business and Finance*; 55:112-128.
13. Cassiman B, Veugelers R, Arts S. (2018). Mind the gap: Capturing value from basic research through combining mobile inventors and partnerships. *Research Policy*; 47(9): 1811–1824.
14. DeNoni I, Orsi L, Belussi F. (2018). The role of collaborative networks in supporting the innovation performances of lagging-behind European regions. *Research Policy*; 47(1): 1–13.
15. Fan S, Wang C. (2019). Firm age, ultimate ownership, and R&D investments. *International Review of Economics and Finance*; 76:1245-1264
16. Chatterjee A, Hambrick D. (2007). It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly*; 52: 351–386.
17. O'Reilly C, Doerr B, Caldwell D, Chatman J. (2014). Narcissistic CEOs and executive compensation. *The Leadership Quarterly*; 25 (2): 218–231.
18. Agnihotri A, Bhattacharya S. (2021). CEO narcissism and myopic management. *Industrial Marketing Management*; 97:145-158.
19. Kim M, Thapa B. (2018). Relationship of ethical leadership, corporate social responsibility and organizational performance. *Journal of Sustainability*; 10(2): 1-16.
20. Ortízde N, Mandojana D, Bansal P. (2016). The long-term benefit of organizational resilience through sustainable business practices. *Strategy Management*; 37(8): 1615-1631.
21. Khoshkar F, Sarshar S. (2022). The role of managers' psychological characteristics on the relationship between ownership of family companies and Research and development investment. *Journal Accounting and Management Vision*; 5(65):31-43
22. Eivani F, Khairullahi F, Abdi H, Kaspour S. (2022). Investing the Role of Ownership Structure in the Relationship between Managers Overconfidence and R&D Expenditures in Terms of Financial Constraints. *Journal of Asset Management and Financing*; 9(4):97-120.
23. Zhang L, Liang B, Bi D, Zhou Y, Yu X. (2021). Relationships Among CEO Narcissism, Debt Financing and Firm Innovation Performance. *Emotion Recognition Using Advanced Artificial Intelligence: Front psychol*; 12: 1-12.
24. Huang J, Zhao J, Cao J. (2021). Environmental regulation and corporate R&D investment-evidence from a quasi-natural experiment. *International Review of Economics and Finance*; 72:154-174.
25. Yook K-H, Lee S-Y. (2020). Chief executive officer narcissism and firm value: The mediating role of corporate social responsibility in the South Korean context. *Corporate Social Responsibility and Environmental Management*; 27(4): 1809-1718.
26. Ezzi F, Jarbouai A, Zouari-Hadji R. (2020). Exploring the relationship between managerial emotional intelligence, R&D and CSR performance. A mediated moderation analysis: *The Journal of High technology management research*; 31: 1-15
27. Konno Y, Itoh Y. (2018). Empirical analysis of R&D in the Japanese construction industry based on the structure conduct performance model. *Cogent Business & Management*; 5: 1-15.