XXII ENGEMA
Encontro Internacional sobre Gestão Empresarial e Meio Ambiente

ISSN: 2359-1048
Novembro 2020

The Impact of Executive Compensation on Environmental Innovation Disclosure in Brazilian Firms

VICTOR DANIEL-VASCONCELOS
UNIVERSIDADE FEDERAL DO CEARÁ

The Impact of Executive Compensation on Environmental Innovation Disclosure in Brazilian Firms

1 Introduction

In recent years, environmental innovation has become part of the business strategy due pressure from various stakeholders such as competitors, suppliers, consumers and regulators (Biscione et al., 2020). Environmental innovation involves the use of non-toxic and harmless materials and production techniques, product selection and processes that minimize environmental degradation (Liao, 2020). In this line, environmental innovation has a key role in providing solutions for renewable energy generation, energy efficiency, decarbonization, among other environmental issues (Losacker & Liefner, 2020). Therefore, environmental innovation can be used by companies and their suppliers to increase their environmental performance (Zhang et al., 2020) and environmental innovation is an inevitable change that firms must make in environmental issues (Jiao et al., 2020).

Sustainability reporting can play an important role in supporting the response to environmental problems such as resource depletion and global warming (Dagiliene et al., 2020) and helps companies comply with their environmental responsibilities, such as regulatory requirements, ensuring greater control over possible environmental damage (Malarvizhi & Matta, 2016). Moreover, firm's environmental disclosure has valuable information about its environmental strategies (Radu et al., 2020) and strengthens the firm's link with its investors, customers, regulators and suppliers (Tzouvanas et al., 2020).

Executive compensation is designed to prevent or promote some behavioral characteristics of executives (Kang, 2017). Compensation packages usually have salary, bonus and stock options (Murphy, 1999). Capital suppliers of a firm when interested in the social and environmental performance of the firm want to make sure that the executive directors of the firms also are focused on the social and environmental performance (Maas, 2018). Social and environmental performance is linked to executive compensation in many organizations (Al-Shaer & Zaman, 2019). In this regard, executives see investment in social and environmental activities as a strategy to improve firm performance and align their interests with those of shareholders (Karim et al., 2018).

Previous studies demonstrate the influence the salary-based compensation (Karim et al., 2018; Lois Schafer Mahoney & Thorne, 2006; McGuire et al., 2003), bonus-based compensation (L. S. Mahoney & Thorne, 2005; Lois Schafer Mahoney & Thorne, 2006) and stock-based compensation (Deckop et al., 2006; Karim et al., 2018; L. S. Mahoney & Thorne, 2005; Lois Schafer Mahoney & Thorne, 2006; Okafor & Ujah, 2020; Peng, 2020) (Berrone & Gomez-Mejia, 2009) on the social and environmental aspects. However, the evidence for the executive compensation in environmental innovation is still scarce.

The objective of the paper is to analyze the influence of executive compensation on the environmental innovation disclosure. Theoretically, the effect of executive compensation on environmental innovation disclosure can be explained using agency theory. According to the agency theory the disclosure of non-financial information, such as environmental disclosure, can be a way for companies to reduce information asymmetry, the cost of capital and share more information with shareholders (Mio et al., 2020) and executive compensation encourages managers to be more concerned with environmental issues and, with this, there is an increase in the disclosure of environmental information to reduce information asymmetry in the decision-making process (Kartadjumena & Rodgers, 2019). In this line, it is believed that the conflict between principal and agent is inevitable (Cherian et al., 2020). Therefore, agency theory provides an appropriate framework to explain and resolve the principal-agent conflict that can occur in a situation where the goals or desires of both sides differ (Pham et al., 2020).

The study collects data from 81 listed firms on the B^3 (Brazil Stock Exchange and Over-the-Counter Market) over a 5-year period (2015-2019). The study contributes to the literature in several aspects. First, the study investigates quantitatively the impact of executive compensation on the environmental innovation disclosure in Brazilian firms. Second, proposes an environmental innovation disclosure metric. Finally, data was obtained from Thomson Reuters database. Thomson Reuters database provides environmental, social and governance (ESG) information of firms from stock market filings and annual company reports (Burkhardt et al., 2020).

The remainder of the paper is organized as follows. Section 2 reviews the literature and develops the relevant research hypotheses. The research design is presented in Section 3. Section 4 reports the empirical results and discussion of the findings. Finally, Section 5 concludes the paper.

2 Literature Review and Hypothesis Development

2.1 Executive compensation and environmental innovation disclosure

Innovation is a crucial element in a firm's competitive advantage and the main mechanism of economic growth (Liu et al., 2020). Firms are adopting environmental innovation as a strategy to achieve environmental sustainability (Song et al., 2020). In this line, innovative goods and services play key roles in the fight against fundamental social and environmental challenges, such as the supply of potable water to the world's population and climate change (Fichter & Tiemann, 2020). Moreover, environmental innovation helps firms attract more investors, suppliers, creditors and other stakeholders and acquire more financial resources for the firm (Liao, 2020).

Engaging executives in social and environmental activities can be seen as their fiduciary duty and by investing in social and environmental activities they can improve shareholder value (Karim et al., 2018). Managers tend to be encouraged to disclose environmental information in a correct way, with the objective of reducing information asymmetry in relation to shareholders (Kartadjumena & Rodgers, 2019). In this context, firms adopt a wide variety of compensation structures to alleviate the problem of alignment of managers' incentives (Peng, 2020). Therefore, compensation is seen as the main tool to align the interests of managers and shareholders and in situations of information asymmetry directors should have short- and long-term incentive systems (Deckop et al., 2006; Sheikh, 2020)

2.2 Salary and environmental innovation disclosure

Salary is a fixed component in executive compensation (Lois Schafer Mahoney & Thorne, 2006; McGuire et al., 2003; Okafor & Ujah, 2020). Higher salaries make executives arrogant which results in less interest from executives in making decisions that promote the interest of society (Okafor & Ujah, 2020) because salary is the only remuneration structure independent of performance (Rekker et al., 2014). Moreover, short-term paid executives are more likely to act only to maximize their personal wealth (Sajko et al., 2020) and executives who have their remuneration based on short-term incentives, such as salary, are financially discouraged from getting involved in social and environmental aspects (Deckop et al., 2006).

Karim et al., (2018), Lois Schafer Mahoney & Thorne (2006) and McGuire et al., (2003) determined that executives with salary-based compensation have a lower incentive to engage in environmental activities. In line with theoretical discussions and prior empirical findings, the following hypothesis is proposed:

Hypothesis 1: There is negative relationship between salary-based compensation and environmental innovation disclosure

2.3 Bonus and environmental innovation disclosure

Annual bonuses link the executive director's compensation to the company's firm performance to motivate them to make decisions that increase firm profit (Fabrizi et al., 2014).

Bonus can be seen as an incentive being important for the alignment of interests between shareholders and executives, because it is the most performance sensitive part (Rekker et al., 2014; Velte, 2019) and acts as an incentive for future performance of the executive (Lois Schafer Mahoney & Thorne, 2006). Therefore, bonus can be seen as a mechanism that reduces the conflict between principal and agent, encouraging greater investments in environmental activities.

Previous studies revealed a positive and significant relationship between bonus-based compensation and environmental aspects (L. S. Mahoney & Thorne, 2005; Lois Schafer Mahoney & Thorne, 2006). In line with theoretical discussions and prior empirical findings, the following hypothesis is proposed:

Hypothesis 2: There is positive relationship between bonus-based compensation and environmental innovation disclosure

2.4 Stock-based compensation and environmental innovation disclosure

According to agency theory, stock-based compensation is an effective way to reduce agency problems, aligning the interests of principals and agents (Zou et al., 2015). Stock-based compensation instead of cash compensation (salary) provides a better alignment between the interests of managers and shareholders (Okafor & Ujah, 2020). In this regard, stock-based compensation provides managers with the possibility to take more risk (Dunbar et al., 2020), affecting an important characteristic of the executive director, which is his approach to risk taking (Kang, 2017) and investments in social and environmental aspects are considered a way of managing risk and are an additional tool that reduces corporate risk (Sheikh, 2020).

Executives who receive stock-based compensation are more likely to take actions consistent with maximizing the company's value over the long term because their wealth will increase if the stock price increases (Lois Schafer Mahoney & Thorne, 2006). Long-term compensation, such as stock-based compensation, provides a greater commitment to demanding environmental strategies, improving environmental performance (Berrone & Gomez-Mejia, 2009). Therefore, long-term compensation structure is more likely to align managers' interests with social and environmental aspects (Deckop et al., 2006; Peng, 2020; Sheikh, 2020; Yuan et al., 2020).

Empirically, Deckop et al., (2006), Karim et al., (2018), L. S. Mahoney and Thorne, (2005), Lois Schafer Mahoney and Thorne (2006), Okafor and Ujah (2020) and Peng (2020) found a significant positive relationship between stock-based compensation and environmental aspects. In line with theoretical discussions and prior empirical findings, the following hypothesis is proposed:

Hypothesis 3: There is positive relationship between stock-based compensation and environmental innovation disclosure

3 Research design

3.1 Sample and data

The sample consists of 81 listed firms on the B^3 (Brazil Stock Exchange and Over-the-Counter Market) collected from 2015 to 2019. The sample is unbalanced, because full data is not available for all companies and for all years, and it consists of a total of 328 firm-year observations. Data on the environmental innovation disclosure was obtained from Thomson Reuters database. Thomson Reuters database provides environmental, social and governance (ESG) information of firms from stock market filings and annual company reports (Burkhardt et al., 2020). Also, we obtain longitudinal data on compensation indicators from the Reference Forms available at the Securities Commission ("CVM") website and financial data were obtained from Compustat database. Table 1 illustrates the sector classification used in this analysis, based on the Brazil Stock Exchange and Over-the-Counter Market classification.

Table 1

Sample distribution by sector of activity

Sector	No. Firms	Frequency	
		Absolute	Relative
Basic Materials	7	31	9,45
Capital Goods and Services	9	35	10.67
Communications	3	12	3,66
Consumer Cyclical	18	71	21,65
Consumer Non-Cyclical	7	31	9,45
Financial	15	60	18,29
Health	5	20	6,10
Information Technology	1	4	1,22
Oil, Gas and Biofuels	5	19	5,79
Utilities	11	45	13,72
Total	81	328	100

As is evident from the data in Table 1, the sample comprised ten activity sectors. Companies belonging to the consumer cyclical sector represent 21.65%, followed by the financial and utilities sectors at 18,29% and 13,72%, respectively. The sector with the lowest representation was Information Technology at 1,22%.

3.2 Dependent variable

Environmental innovation disclosure is presented in this study as the dependent variable, in line with previous studies (María Consuelo Pucheta-Martínez et al., 2020; María Consuelo Pucheta-Martínez & Gallego-Álvarez, 2019), this variable is calculated as the ratio between the aggregate of 23 items focused on environmental innovation issues and the total number of items analyzed. If the company discloses information on an item, this will take the value 1; if not, the value is 0. The 23 items analyzed of environmental innovation are shown in Table 2.

Table 2

Environmental innovation disclosure items

Environmental products	Eco-design products	Noise reduction	Hybrid vehicles	Environmental assets under MGT	Equator principles Equator
Equator principles or environmental projects	Environmental project financing	Nuclear	Labelled wood	Organic products initiatives	Product impact minimization
Take-back and recycling initiatives	Responsible use of environmental products	GMO products	Agrochemical 5% revenue	Agrochemical products Agrochemical	Animal testing in the past 12 fiscal years
Animal testing cosmetics	Animal testing reduction	Renewable clean energy products	Water Technologies	Sustainable building products	

Note: MGT = management; GMO = genetically modified organisms.

3.3 Independent variables

We divide the executive compensation into three groups: salary, bonus and stock – based. Salary is calculated as a percentage of salary payments to total executive compensation, in line with previous studies (Deckop et al., 2006; Karim et al., 2018). Bonus is calculated as

a percentage of bonus payments to total executive compensation, as proposed by Deckop et al. (2006) and Karim et al., (2018). Stock – based compensation is measured as a percentage of stock-based compensation to total executive compensation, in line with previous studies (Deckop et al., 2006; Karim et al., 2018; L. S. Mahoney & Thorne, 2005; Lois Schafer Mahoney & Thorne, 2006; McGuire et al., 2003).

3.4 Control variables

We control other potential factors that may influence environmental innovation disclosure. Company performance was calculated as market capitalization of common stock plus book value liabilities divided by the book value of total assets (Aggarwal et al., 2019; M C Pucheta-Martínez et al., 2019; María Consuelo Pucheta-Martínez et al., 2020). Profitability in line with García-Sánchez (2020) was measured as income after taxes for the fiscal period divided by total assets. Leverage, was also controlled, measured as debt over total assets (Olthuis & van den Oever, 2020; Orazalin, 2020; Orazalin & Baydauletov, 2020; M C Pucheta-Martínez et al., 2019; María Consuelo Pucheta-Martínez et al., 2020). The company size was calculated as natural logarithm of total assets (Orazalin, 2020; Orazalin & Baydauletov, 2020; María Consuelo Pucheta-Martínez et al., 2020). See the variables description in Table 3.

Table 3

Variables description

Variable name	Variable name	Model name	Proxy
Dependent	Environmental innovation disclosure	EID	Environmental innovation disclosure items/ total number of items
Independent	Salary-based compensation	SALARY	Salary payments/ total executive compensation
Independent	Bonus-based compensation	BONUS	Bonus payments/ total executive compensation
Independent	Stock-based compensation	STOCK	Stock-based compensation/ total executive compensation
Control	Company performance	QTOBIN	Market capitalization of common stock plus book value liabilities/book value of total assets.
Control	Profitability	ROA	Income after taxes for the fiscal period/Total assets
Control	Leverage	LEV	Total debt/Total assets
Control	Firm size	FSIZE	Natural logarithm of total assets

3.5 Empirical models

The hypothesis proposed will be estimated with the following model:

$$CORR_{i,t} = \beta_0 + \beta_1 SALARY_{i,t} + \beta_2 BONUS_{i,t} + \beta_3 STOCK_{i,t} + \beta_4 QTOBIN_{i,t} + \beta_5 ROA_{i,t} + \beta_6 LEV_{i,t} \beta_7 TAM_{i,t} + \varepsilon \quad (1)$$

where, EID is the environmental innovation disclosure, measured using environmental innovation disclosure items divided by total number of items. SALARY is the salary-based compensation, calculated using salary payments divided by total executive compensation. BONUS is the bonus-based compensation, measured using bonus payment divided by executive compensation. STOCK is the stock-based compensation calculated using stock-based compensation divided by total executive compensation. QTOBIN is the company performance, calculated using market capitalization of common stock plus book value liabilities divided by book value of total assets. ROA is the profitability, measured using income after taxes for the fiscal period divided by total assets. LEV is the leverage, calculated using total debt divided by total assets. FSIZE is the firm size, measured using natural logarithm of total assets. β_0 the constant, i represents firm, t represents time dimension (years), β_1 to β_7 are the regression coefficients, ε is a vector of the stochastic error term.

4 Results

4.1 Descriptive Statics

Table 4 reports a summary of the descriptive statistics for all variables considered in the study model. The average environmental innovation disclosure is 0,705 with an SD of 0,081, and it ranges from 0 to 0,260.

Table 4

Descriptive statics

Variables	N	Mean	SD	Minimum	Maximum
EID	328	0,070	0,081	0	0,260
SALARY	328	0,367	0,136	0	1
BONUS	328	0,115	0,157	0	0,798
STOCK	328	0,169	0,157	-0,207	0,988
QTOBIN	328	0,301	0,287	0	4,010
ROA	328	0,030	0,107	-1,167	0,366
LEV	328	0,283	0,197	0	0,897
FSIZE	328	23,711	1,604	20,604	28,071

Notes: EID is the environmental innovation disclosure, measured using environmental innovation disclosure items divided by total number of items. SALARY is the salary-based compensation, calculated using salary payments divided by total executive compensation. BONUS is the bonus-based compensation, measured using bonus payment divided by executive compensation. STOCK is the stock-based compensation calculated using stock-based compensation divided by total executive compensation. QTOBIN is the company performance, calculated using market capitalization of common stock plus book value liabilities divided by book value of total assets. ROA is the profitability, measured using income after taxes for the fiscal period divided by total assets. LEV is the leverage, calculated using total debt divided by total assets. FSIZE is the firm size, measured using natural logarithm of total assets.

The average level of salary-based compensation is 36,7% which is similar to 31% reported by Karim et al., (2018) and it ranges from 0 to 100%. The mean value of bonus is 0,115 which is less than 0,251 reported by L. S. Mahoney & Thorne (2005) and similar to 0,13 reported by Deckop et al., (2006) and it varies between 0 and 0,988. The average level of stock-based compensation is 16.9% which is less than 49%, 60.7% and 63% reported by Deckop et al., (2006), Karim et al., (2018) and L. S. Mahoney and Thorne, (2005), respectively and it ranges from -0,207 to 0,988.

4.2 Multivariate analysis

We test our hypotheses using the generalized method of moments (GMM) system estimator appropriate for relatively short periods (Blundell & Bond, 1998). GMM method is based on the assumption that the variables in the model are valid instruments and the error terms are not serially correlated (Crisóstomo et al., 2020; Crisóstomo & de Freitas Brandão, 2019) and allows the use of instrumental variables more easily (ur Rehman et al., 2020). This method also resolves the problem of endogeneity and provides solutions for biases of simultaneity, reverse causality and any omitted variables, controlling the individual and temporal effects (Djebali & Zaghdoudi, 2020). Further, this technique is used in social science because it presents several advantages, such as, it avoids unobservable heterogeneity resulting from specific characteristics of each firm that are constant in time, eliminating the risk of biased results and it allows controlling the possible endogeneity of independent variables (Pérez-Cornejo et al., 2020).

All the model specifications pass the AR (2) test analyzes the non-serial correlation between the error terms and validity of the instruments and the Hansen test of overidentifying restriction is performed to verify the existence of correlation between the instruments and the error term. The Hansen test for over-identification of restrictions explores the lack of correlation between the instruments and the error term testing the validity of the model specifications (Crisóstomo et al., 2020; Crisóstomo & de Freitas Brandão, 2019). Table 5 presents the findings of all the models.

Table 5

Results of the generalized method of moments GMM

Variables	Model 1		Model 2		Model 3	
	Coef	p-value	Coef	p-value	Coef	p-value
EID $_{(t-1)}$	-0,439	0,326	-0,536	0,307	-0,538	0,333
SALARY	-0,137	0,040**				
BONUS			0,070	0,346		
STOCK					0,004	0,924
QTOBIN	0,013	0,460	0,019	0,361	0,019	0,329
ROA	-0,039	0,764	-0,107	0,483	-0,098	0,478
LEV	-0,044	0,499	-0,054	0,405	-0,040	0,579
FSIZE	0,039	0,017**	0,046	0,016**	0,045	0,022**
Intercept	-0,802	0,038**	-1,030	0,026	-1,004	0,033**
Year dummy	Yes		Yes		Yes	
No. of firms	85		85		85	
No. of observ	301		301		301	
Instruments	29		29		29	
Wald χ^2 test	18,39	0,000***	18,08	0,000***	19,26	0,000***
AR (1)	-2,22	0,026	-1,05	0,295	-1,18	0,237
AR (2)	0,42	0,672	-1,30	0,195	-0,79	0,430
Hansen test	14,32	0,111	14,12	0,777	15,41	0,696

Notes: EID is the environmental innovation disclosure, measured using environmental innovation disclosure items divided by total number of items. SALARY is the salary-based compensation, calculated using salary payments divided by total executive compensation. BONUS is the bonus-based compensation, measured using bonus payment divided by executive compensation. STOCK is the stock-based compensation calculated using stock-based compensation divided by total executive compensation. QTOBIN is the company performance, calculated using market capitalization of common stock plus book value liabilities divided by book value of total assets. ROA is the profitability, measured using income after taxes for the fiscal period divided by total assets. LEV is the leverage, calculated using total debt divided by total assets. FSIZE is the firm size, measured using natural logarithm of total assets. Models are estimated by two step system generalized method of moments (GMM). *, ** and *** statistically significant at 0.10, 0.05 and 0.01 levels, respectively.

In Model 1, we explore how salary-based compensation affects environmental innovation disclosure. Model 2 analyzes the impact of bonus-based compensation on environmental innovation disclosure. In Model 3 we examine the association between the stock-based compensation in environmental innovation disclosure.

In Model 1, we explore the influence of salary-based compensation on the environmental innovation disclosure. Our results indicate a negative and significant coefficient (coefficient = -0,137; p = 0.040). This result supports Hypothesis 1 and corroborates the findings of Karim et al., (2018), Lois Schafer Mahoney and Thorne (2006) and McGuire et al., (2003) that salary-based compensation has a negative impact on environmental activities. Our result is also consistent with the theoretical predictions that executives based on short-term compensation are less encouraged to engage in environmental activities.

Moving to model 2, we examine the association between bonus-based compensation and environmental innovation disclosure. The findings reveal a positive and insignificant coefficient (coefficient = 0,070; p = 0, 346) of bonus-based compensation on environmental innovation disclosure, implying that Hypothesis 2 is not supported. Our result does not provide support for the resource dependency theory which says that the board specific skills diversity provides for greater board effectiveness and decisions in line with environmental issues. This result is consistent with the empirical findings of Kang (2017) and Okafor and Ujah (2020).

Model 3 analyses the effect of stock-based compensation on the environmental innovation disclosure. The variable the stock-based compensation provides a positive sign and not statistically significant (coefficient = 0,004; p = 0,924), thus that Hypothesis 3 is not supported. Our results show that stock-based compensation is not a determinant factor on environmental innovation disclosure, i.e. it does not support the idea of agency theory that long-term incentives play a key role in corporate governance and are efficient in resolving agency conflicts. The summary of hypotheses is presented in Table 6.

Table 6

Summary of hypotheses

Hypothesis	Variable name	Expected sign	Actual sign	Level of support
Hypothesis 1: Hypothesis 1: There is negative relationship between salary-based compensation and environmental innovation disclosure	SALARY	(-)	(-)	Supported
Hypothesis 2: There is positive relationship between bonus-based compensation and environmental innovation disclosure	BONUS	(+)	(0)	Not Supported
Hypothesis 3: There is positive relationship between stock-based compensation and environmental innovation disclosure	STOCK	(+)	(0)	Not Supported

In summary, the results confirm that salary-based compensation does to promote environmental initiatives. The results are consistent with agency theory, and emphasizes that short-term compensation (salary-based compensation) decrease engagement in environmental disclosure.

5 Conclusion

This study analyzes the link between executive compensation and environmental innovation disclosure. Using a data of 81 listed firms on the B^3 (Brazil Stock Exchange and Over-the-Counter Market) collected from 2015 to 2019, we employ two-step system GMM to test study hypotheses. We measure environmental innovation disclosure as the ratio between the aggregate of 23 items focused on environmental innovation issues and the total number of items analyzed.

We find a negative and significant relationship between salary-based compensation and environmental innovation disclosure. This result is consistent with, agency theory. A positive and insignificant relationship between bonus-based compensation and environmental innovation disclosure was also found. In addition, we noted a positive and insignificant relationship between stock-based compensation and environmental innovation disclosure.

This study suffers of some limitations. We also noted that few firms disclose their environmental aspects this represents a difficulty in environmental innovation disclosure. Future research could focus on other environmental aspects, such as greenhouse gas emissions.

References

Aggarwal, R., Jindal, V., & Seth, R. (2019). Board diversity and firm performance: The role of business group affiliation. *International Business Review*, *28*(6), 101600. https://doi.org/https://doi.org/10.1016/j.ibusrev.2019.101600

Al-Shaer, H., & Zaman, M. (2019). CEO Compensation and Sustainability Reporting Assurance: Evidence from the UK. *Journal of Business Ethics*, *0123456789*, 1–20. https://doi.org/10.1007/s10551-017-3735-8

Berrone, P., & Gomez-Mejia, L. R. (2009). Environmental performance and executive compensation: An integrated agency-institutional perspective. *Academy of Management Journal*, *52*(1), 103–126. https://doi.org/10.5465/AMJ.2009.36461950

Biscione, A., Caruso, R., & de Felice, A. (2020). Environmental innovation in European transition countries. *Applied Economics*, 1–15.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143.

Burkhardt, K., Nguyen, P., & Poincelot, E. (2020). Agents of change: Women in top management and corporate environmental performance. *Corporate Social Responsibility and Environmental Management*, *September 2019*, 1–14. https://doi.org/10.1002/csr.1907

Cherian, J., Safdar Sial, M., Tran, D. K., Hwang, J., Khanh, T. H. T., & Ahmed, M. (2020). The

Strength of CEOs' Influence on CSR in Chinese listed Companies. New Insights from an Agency Theory Perspective. *Sustainability*, *12*(6), 2190.

Crisóstomo, V. L., Brandão, I. de F., & López-Iturriaga, F. J. (2020). Large shareholders' power and the quality of corporate governance: An analysis of Brazilian firms. *Research in International Business and Finance*, *51*(December 2018), 101076. https://doi.org/10.1016/j.ribaf.2019.101076

Crisóstomo, V. L., & de Freitas Brandão, I. (2019). The ultimate controlling owner and corporate governance in Brazil. *Corporate Governance (Bingley)*, *19*(1), 120–140. https://doi.org/10.1108/CG-01-2018-0043

Dagiliene, L., Frendzel, M., Sutiene, K., & Wnuk-Pel, T. (2020). Wise managers think about circular economy, wiser report and analyse it. Research of environmental reporting practices in eu manufacturing companies. *Journal of Cleaner Production*, 121968. https://doi.org/https://doi.org/10.1016/j.jclepro.2020.121968

Deckop, J. R., Merriman, K., & Shurti, G. (2006). The effects of CEO pay structure on corporate social performance. *Journal of Management*, *32*(3), 329–342. https://doi.org/10.1177/0149206305280113

Djebali, N., & Zaghdoudi, K. (2020). Testing the governance-performance relationship for the Tunisian banks: a GMM in system analysis. *Financial Innovation*, *6*, 1–24.

Dunbar, C., Li, F., & Shi, Y. (2020). CEO risk-taking incentives and corporate social responsibility. *Journal of Corporate Finance*, 101714.

Fabrizi, M., Mallin, C., & Michelon, G. (2014). The Role of CEO's Personal Incentives in Driving Corporate Social Responsibility. *Journal of Business Ethics*, *124*(2), 311–326. https://doi.org/10.1007/s10551-013-1864-2

Fichter, K., & Tiemann, I. (2020). Impacts of promoting sustainable entrepreneurship in generic business plan competitions. *Journal of Cleaner Production*, *267*, 122076. https://doi.org/https://doi.org/10.1016/j.jclepro.2020.122076

García-Sánchez, I.-M. (2020). The moderating role of board monitoring power in the relationship between environmental conditions and corporate social responsibility. *Business Ethics: A European Review*, *29*(1), 114–129. https://doi.org/10.1111/beer.12242

García Martín, C. J., & Herrero, B. (2020). Do board characteristics affect environmental performance? A study of EU firms. *Corporate Social Responsibility and Environmental Management*, *27*(1), 74–94. https://doi.org/10.1002/csr.1775

Kang, J. (2017). Unobservable CEO Characteristics and CEO Compensation as Correlated Determinants of CSP. *Business and Society*, *56*(3), 419–453. https://doi.org/10.1177/0007650314568862

Karim, K., Lee, E., & Suh, S. (2018). Corporate social responsibility and CEO compensation structure. *Advances in Accounting*, *40*, 27–41. https://doi.org/https://doi.org/10.1016/j.adiac.2017.11.002

Kartadjumena, E., & Rodgers, W. (2019). Executive compensation, sustainability, climate, environmental concerns, and company financial performance: Evidence from Indonesian commercial banks. *Sustainability*, *11*(6), 1673.

Liao, Z. (2020). Is environmental innovation conducive to corporate financing? The moderating role of advertising expenditures. *Business Strategy and the Environment*, *29*(3), 954–961. https://doi.org/10.1002/bse.2409

Liu, B., Sun, P.-Y., & Zeng, Y. (2020). Employee-related corporate social responsibilities and corporate innovation: Evidence from China. *International Review of Economics & Finance*, *70*, 357–372. https://doi.org/https://doi.org/10.1016/j.iref.2020.07.008

Losacker, S., & Liefner, I. (2020). Regional lead markets for environmental innovation. *Environmental Innovation and Societal Transitions*, *37*, 120–139. https://doi.org/https://doi.org/10.1016/j.eist.2020.08.003

Maas, K. (2018). Do Corporate Social Performance Targets in Executive Compensation Contribute to Corporate Social Performance? *Journal of Business Ethics*, *148*(3), 573–585. https://doi.org/10.1007/s10551-015-2975-8

Mahoney, L. S., & Thorne, L. (2005). Corporate social responsibility and long-term compensation: Evidence from Canada. *Journal of Business Ethics*, *57*(3), 241–253. https://doi.org/10.1007/s10551-004-5367-z

Mahoney, Lois Schafer, & Thorne, L. (2006). An examination of the structure of executive compensation and corporate social responsibility: A Canadian investigation. *Journal of Business Ethics*, *69*(2), 149–162. https://doi.org/10.1007/s10551-006-9073-x

Malarvizhi, P., & Matta, R. (2016). "Link between Corporate Environmental Disclosure and Firm Performance"–Perception or Reality? *The British Accounting Review*, *36*(1), 107–117.

McGuire, J., Dow, S., & Argheyd, K. (2003). CEO Incentives and Corporate Social Performance. *Journal of Business Ethics*, *45*(4), 341–359. https://doi.org/10.1023/A:1024119604363

Mio, C., Fasan, M., Marcon, C., & Panfilo, S. (2020). The predictive ability of legitimacy and agency theory after the implementation of the EU directive on non-financial information. *Corporate Social Responsibility and Environmental Management*.

Murphy, K. J. (1999). *Murphy_Execcomp_Hle_1999*. *June*, 1–91. papers3://publication/uuid/3DC06196-20D7-49BE-9E07-5779C52B93A7

Okafor, C. E., & Ujah, N. U. (2020). Executive compensation and corporate social responsibility: does a golden parachute matter? *International Journal of Managerial Finance*.

Olthuis, B. R., & van den Oever, K. F. (2020). The board of directors and CSR: How does ideological diversity on the board impact CSR? *Journal of Cleaner Production*, *251*, 119532. https://doi.org/https://doi.org/10.1016/j.jclepro.2019.119532

Orazalin, N. (2020). Do board sustainability committees contribute to corporate environmental and social performance? The mediating role of corporate social responsibility strategy. *Business Strategy and the Environment*, *29*(1), 140–153.

Orazalin, N., & Baydauletov, M. (2020). Corporate social responsibility strategy and corporate environmental and social performance: The moderating role of board gender diversity. *Corporate Social Responsibility and Environmental Management*, *January*, 1–13. https://doi.org/10.1002/csr.1915

Peng, C.-W. (2020). The role of business strategy and CEO compensation structure in driving corporate social responsibility: Linkage towards a sustainable development perspective. *Corporate Social Responsibility and Environmental Management*, *27*(2), 1028–1039. https://doi.org/10.1002/csr.1863

Pérez-Cornejo, C., de Quevedo-Puente, E., & Delgado-García, J. B. (2020). Reporting as a booster of the corporate social performance effect on corporate reputation. *Corporate Social Responsibility and Environmental Management*, *27*(3), 1252–1263. https://doi.org/10.1002/csr.1881

Pham, H. C., Ngo, D. A., Le, H. T., & Nguyen, T. T. (2020). Corporate social responsibility and the pricing of seasoned equity offerings: Does executive firm-related wealth matter? *Journal of Asian Finance, Economics and Business*, *7*(8), 297–308. https://doi.org/10.13106/JAFEB.2020.VOL7.NO8.297

Prado-Lorenzo, J. M., & Garcia-Sanchez, I. M. (2010). The Role of the Board of Directors in Disseminating Relevant Information on Greenhouse Gases. *Journal of Business Ethics*, *97*(3), 391–424. https://doi.org/10.1007/s10551-010-0515-0

Pucheta-Martínez, M C, Gallego-Álvarez, I., & Bel-Oms, I. (2019). Varieties of capitalism, corporate governance mechanisms, and stakeholder engagement: An overview of

coordinated and liberal market economies. *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.1840

Pucheta-Martínez, María Consuelo, Bel-Oms, I., & Rodrigues, L. L. (2020). Does stakeholder engagement encourage environmental reporting? The mediating role of firm performance. *Business Strategy and the Environment*, *May*, 1–13. https://doi.org/10.1002/bse.2555

Pucheta-Martínez, María Consuelo, & Gallego-Álvarez, I. (2019). Corporate Environmental Disclosure Practices in Different National Contexts: The Influence of Cultural Dimensions. *Organization & Environment*, 1086026619860263. https://doi.org/10.1177/1086026619860263

Radu, C., Caron, M. A., & Arroyo, P. (2020). Integration of carbon and environmental strategies within corporate disclosures. *Journal of Cleaner Production*, *244*. https://doi.org/10.1016/j.jclepro.2019.118681

Rekker, S. A. C., Benson, K. L., & Faff, R. W. (2014). Corporate social responsibility and CEO compensation revisited: Do disaggregation, market stress, gender matterα. *Journal of Economics and Business*, *72*, 84–103. https://doi.org/10.1016/j.jeconbus.2013.11.001

Sajko, M., Boone, C., & Buyl, T. (2020). CEO greed, corporate social responsibility, and organizational resilience to systemic shocks. *Journal of Management*, 0149206320902528.

Sheikh, S. (2020). CEO inside debt and corporate social responsibility. *International Journal of Managerial Finance*.

Song, W., Wang, G.-Z., & Ma, X. (2020). Environmental innovation practices and green product innovation performance: A perspective from organizational climate. *Sustainable Development*, *28*(1), 224–234. https://doi.org/10.1002/sd.1990

Tzouvanas, P., Kizys, R., Chatziantoniou, I., & Sagitova, R. (2020). Environmental disclosure and idiosyncratic risk in the European manufacturing sector. *Energy Economics*, 104715. https://doi.org/https://doi.org/10.1016/j.eneco.2020.104715

ur Rehman, R., Riaz, Z., Cullinan, C., Zhang, J., & Wang, F. (2020). Institutional ownership and value relevance of corporate social responsibility disclosure: Empirical evidence from China. *Sustainability (Switzerland)*, *12*(6). https://doi.org/10.3390/su12062311

Velte, P. (2019). Do CEO incentives and characteristics influence corporate social responsibility (CSR) and vice versa? A literature review. *Social Responsibility Journal*, *September*. https://doi.org/10.1108/SRJ-04-2019-0145

Yuan, Y., Lu, L. Y., Tian, G., & Yu, Y. (2020). Business Strategy and Corporate Social Responsibility. *Journal of Business Ethics*, *162*(2), 359–377. https://doi.org/10.1007/s10551-018-3952-9

Zhang, Q., Pan, J., & Feng, T. (2020). Green supplier integration and environmental performance: do environmental innovation and ambidextrous governance matter? *International Journal of Physical Distribution & Logistics Management*.

Zou, H. L., Zeng, S. X., Lin, H., & Xie, X. M. (2015). Top executives' compensation, industrial competition, and corporate environmental performance: Evidence from China. *Management Decision*, *53*(9), 2036–2059. https://doi.org/10.1108/MD-08-2014-0515