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Effect of Economic Freedom on Carbon Disclosure: An International Investigation

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Abstract

Objective: This study investigates how the institutional variables of economic freedom affect the disclosure of carbon by companies.
Method: Data from a sample of 1,328 companies based in the 19 countries that emit the most carbon into the atmosphere is analyzed through a hierarchical regression, in which the dependent variable is the disclosure of carbon, and the independent variables represent the degree of economic freedom of the countries.
Results: The results found indicate that companies disclose more information about carbon emissions in countries with greater government participation in the economy and where the law is more enforced.
Contribution: Our study brings new evidence about the determinants of carbon disclosure using the theoretical lens of the Varieties of Capitalism (VoC) approach, in addition to important contributions for policy makers and managers.

Keywords: Economic Freedom; Carbon Disclosure; Corporate Social Responsibility; Varieties of Capitalism.

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Introduction

The protection of natural ecosystems is a global challenge and companies play an important role in the process of sustainable development (Hartmann & Uhlenbruck, 2015). In recent years, the pressures and demands for companies to disclose environmental information have increased considerably (Nekhili et al., 2017; Ortas et al., 2019). The disclosure of environmental information has been an important tool for corporate transparency (Alazzani & Wan-Hussin, 2013; Hourneaux Junior et al., 2017).

Nesse sentido, há um interesse crescente de uma ampla gama de *stakeholders* em relação à Responsabilidade Social Corporativa (RSC) (Gallego-Álvarez & Quina-Custodio, 2017; Pinheiro, da Silva Filho, et al., 2021). A RSC compreende as medidas tomadas por uma empresa para medir os esforços feitos para melhorar o meio ambiente e o bem-estar social. Um de seus aspectos diz respeito à divulgação de informações sobre as emissões de carbono, fator significativo nas mudanças climáticas globais (Dhanda & Malik, 2020).

A Contabilidade Ambiental informa em seus relatórios os fluxos monetários e físicos demonstrando os impactos ambientais das atividades industriais. O objetivo é incentivar a sustentabilidade por meio do uso e reaproveitamento de materiais, minimizando sua disposição final na forma de resíduos sem valor econômico aparente, mas com alto impacto ambiental. Além disso, o rastreamento dos laudos permite à Contabilidade determinar possíveis contingências ambientais de acordo com a classificação dos gases, efluentes e resíduos sólidos em relação à sua periculosidade ambiental (Bonelli & Robles Jr, 2013).

In this regard, there is a growing interest from a wide range of stakeholders concerning corporate social responsibility (CSR) (Gallego-Álvarez & Quina-Custodio, 2017; Pinheiro, da Silva Filho, et al., 2021). CSR comprises the steps taken by a company to measure the efforts made to improve the environment and social well-being. One of its aspects concerns the disclosure of information on carbon emissions, a significant factor in global climate change (Dhanda & Malik, 2020).

Environmental Accounting informs in its reports the monetary and physical flows demonstrating the environmental impacts of industrial activities. The objective is to encourage sustainability through the use and reuse of materials, minimizing their final disposal in the form of waste with no apparent economic value, but with a high environmental impact. In addition, the tracking of reports allows Accounting to determine possible environmental contingencies according to the classification of gasses, effluents, and solid waste concerning their environmental danger (Bonelli & Robles Jr, 2013).

Given the growing attention to carbon emission and its consequences on climate change, the academic literature has been expanding studies on the factors that influence companies to disclose their carbon emissions, such as company size, corporate governance, industry type, and management factors (Dhanda & Malik, 2020; Hsueh, 2019; Liao et al., 2015). However, no previous research has investigated the relationship between countries' economic freedom and the disclosure of carbon emissions.

Additionally, there is a need for studies that examine which factors at the country level influence environmental disclosure and carbon disclosure (Ioannou & Serafeim, 2012; Pinheiro, Sampaio, et al., 2021). Some studies (Baldini et al., 2018; Barkemeyer et al., 2018; Ioannou & Serafeim, 2012; Jensen & Berg, 2012) have analyzed the influence of the national business system on environmental disclosure, finding that certain national characteristics, such as the quality of education, labor issues and level of corruption, shape the ethical behavior of companies.

Another challenge in the works that address institutional drivers and disclosure of corporate social responsibility is to find new theories to support the results (Garcia et al., 2020). According to the study by Frynas and Yamahaki (2016), 45% of the articles published on corporate social responsibility, from 1990 to 2014, used the theoretical approach of Stakeholder Theory or Institutional Theory. Frynas and Yamahaki (2016) argue that theories are important to direct explanations of carbon disclosure.

Given these limitations from previous studies, our study has the following research question: How does the country's level of economic freedom affect carbon disclosure? To answer this question, our study analyzes the four institutional variables related to economic freedom, according to the study by Graafland (2019). The dependent variable is the level of carbon disclosure of 1328 companies based in the 19 countries that emit the most carbon into the atmosphere.

The results found show that certain economic characteristics of countries affect the disclosure of companies' carbon. A greater rule of the law positively affects the disclosure of carbon, and the greater prevalence of non-tariff barriers

and the level of economic freedom negatively affect the disclosure of carbon. Unlike what we predicted; the findings show that greater government participation in economic activities is necessary to establish minimum regulations to encourage carbon disclosure.

Our study contributes to the extant literature in the following ways. First, although the study by Graafland (2019) states that a country's level of economic freedom is measured by four indicators, his research analyzed only two indicators (government size and freedom from government regulations). Therefore, in addition to bringing new evidence, our work thoroughly investigates the level of economic freedom in countries. Second, our study analyzes a sample of companies based in different institutional environments, under the theoretical lens of the Variety of Capitalism (VoC) approach, which is a recent extension of Institutional Theory.

Third, our study investigates the determinants of carbon disclosure, an extension of environmental disclosure, and that there is still little research in the field. Fourth, our findings support the thesis of the VoC approach, which states that the responsible behavior of firms varies according to the characteristics of national economic institutions. Fifth, the cross-country analysis presents interesting results for the field, since several studies analyze the disclosure of carbon with a national focus (Hartmann & Uhlenbruck, 2015). Firms located in the same country tend to have similar carbon disclosure characteristics (Fransen, 2013). In addition to academic contributions, this study has implications for policymakers and managers.

The remainder of the paper is structured as follows. In the next section, we present the VoC approach and the developed hypotheses. Subsequently, we describe the methods used in conducting this study and report the empirical results. In the next section, we discuss the findings, presenting the contributions and implications. Finally, we conclude the paper with the main findings, limitations, and directions for future studies.

2. Varieties of capitalism approach

The Variety of Capitalism (VoC) approach is a recent extension of Institutional Theory, developed by Hall and Soskice (2001) in the late 1990s to understand institutional similarities and differences between economies and the way companies react to different arrangements, placing them at the center of the analysis and recognizing what governments can and cannot do (Gallego-Álvarez & Quina-Custodio, 2017; Hartmann & Uhlenbruck, 2015; Pucheta-Martínez et al., 2019).

Varieties of Capitalism focus on companies and how they interact strategically to solve the coordination problems that arise as a result of their activities (Hall & Soskice, 2001). This approach links aspects of the micro level, related to the rational and strategic behavior of actors and organizations, to those of the macro level, related to economic policy and the functioning of national institutions (Gallego-Álvarez & Quina-Custodio, 2017; Pucheta-Martínez et al., 2019). In this regard, they need to develop relationships to solve coordination problems central to their core competencies in five spheres (Hall & Soskice, 2001).

The first sphere concerns labor relations, in which companies need to coordinate the negotiation of wages and working conditions between their workforce and the organizations that represent them and other employers. In the sphere of vocational training and education, companies face the challenge of ensuring a workforce with adequate skills while workers face the problem of deciding how much to invest in which skills. This issue goes beyond companies and workers and is also related to the levels of qualification and competitiveness of the economy as a whole (Hall & Soskice, 2001).

The coordination of corporate governance issues makes up the third sphere of relationship, which companies use to access financing and investors to guarantee a return on their investments. The fourth sphere is related to the interrelationship between companies, which refers to the relationships that a company establishes with other companies, and with its suppliers and customers, to ensure stable demand for its products, appropriate supplies of inputs, and access to technology (Hall & Soskice, 2001).

Finally, companies face a set of coordination problems concerning their employees by having to ensure that they have the necessary skills and that they cooperate well with others to promote the company's goals. In addition, workers develop reservoirs of specialized information about company operations that can be valuable to management, but also have the ability to retain such information or efforts (Hall & Soskice, 2001).

Pucheta-Martínez et al. (2019) highlight the role of some social and institutional institutions in this process, which, according to Hartmann and Uhlenbruck (2015), shape the behavior and performance of the company. The VoC approach considers that the different forms adopted by capitalist systems can be determined by the way the social partners and institutional systems, resulting mainly from political commitment, are structured

in each national context (Gallego-Álvarez & Quina-Custodio, 2017).

The legal institution is related to the State's power of influence over the economy of a country in three different ways: i) directly, by being actively and directly involved in economic production through state-owned companies; ii) indirectly, through capital provision, favoring or involvement in corporate governance; and iii) through the general approach it takes about the economic life of the nation (Pucheta-Martínez et al., 2019). According to Hartmann and Uhlenbruck (2015), a strong state is perceived as having comprehensive policies and regulations on environmental preservation and, therefore, companies located in these countries are better prepared to meet and even exceed regulatory requirements.

To better understand these relationships and the coordination problems that companies face in different spheres and national characteristics, Varieties of Capitalism divide some advanced economies into liberal market economies (LMEs), aimed at shareholders, and coordinated market economies (CMEs), aimed at stakeholders, based on the mechanism for allocating resources, profits and risk (Pucheta-Martínez et al., 2019).

Thus, while in liberal market economies the results of balancing the company's behavior are generally given by the conditions of supply and demand in competitive markets, in coordinated market economies such balance is often the result of strategic interaction between companies and other actors (Hall & Soskice, 2001). Table 1 presents the characteristics of the five spheres in which companies need to develop relationships, the role of institutions in this process, as well as their characteristics according to the type of economy in which they are inserted.

Table 1: Characteristics of institutions in liberal and coordinated markets.

Institutions	Liberal market economy	Coordinated market economy
Labor relations	Competitive labor markets, flexible labor contracts	Employee associations and labor organizations, long-term work contracts
Vocational training and education	General skills and strategies developed by the company itself	Public training and labor market policies, specific skills based on the company or sector implemented by different organizations and associations
Corporate governance	More developed corporate governance mechanisms, greater diversification of the board	Undeveloped corporate governance
Interrelationship between companies	Market relations, formal contracts, strong antitrust regulations	Joint projects, formal and informal cooperation, antitrust regulation
Financial market	Strong stock market, financing from market investors, important short-term profitability	Weak and underdeveloped stock market, strong banking system, financing from bank loans, little importance for short-term profitability

Source: Prepared by the authors based on Hall and Soskice (2001).

Table 1 allows us to infer that the main characteristics of a liberal market economy are a strong stock market, protection of property rights, a flexible labor market, and strong corporate governance, with greater economic freedom. According to Akadırı et al. (2021), economic freedom concerns the fundamental right of humans to control and dominate their property or work, that is, in a free market, people have the freedom to produce, work, invest, and consume in whatever way they prefer. Therefore, economic activities occur without government interference, as long as the actions do not violate the rights of third parties.

The study by Graafland (2019) shows that economic freedom comprises four broad categories: (1) small government (low government spending, low tax burden, no government company), (2) rule of law (property rights, integrity of the government and judicial effectiveness), (3) open markets (commercial freedom, investment freedom, financial freedom) and (4) freedom from government regulation (commercial freedom, freedom of work and monetary freedom). From this perspective, our study selected these four categories of economic freedom to analyze the institutional environment of countries.

2.1 Economic Freedom and Carbon Disclosure: Research Hypotheses

In larger governments, information flows less quickly and less directly between economic actors. In addition, in economies with greater government participation, there is less innovative entrepreneurship (Herrera-Echeverri et al., 2013). In that sense, when the government becomes bigger, companies have less freedom to operate in their own way, which can reduce your participation in additional issues, such as sustainability (Graafland, 2019). According to Baldini et al. (2018) and Batistella et al. (2021), companies that operate in economies with great influence from the government feel a lesser need to produce information in addition to the required formality of the institutions. Based on these arguments, we posit that:

H1. Ceteris paribus, the size of government has a negative effect on carbon disclosure.

Rule of law measures the perception of the extent to which agents have confidence in the rules of society. In societies with a higher rule of law, contracts are of higher quality and laws are more applicable (Coluccia et al., 2018). According to Walker et al. (2019), the performance of companies in social responsibility reflects the institutional factors of the country where they operate. In this sense, in countries with a low rule of law and a high level of corruption, companies that adopt publicly ethical practices may be exposed to the risk of losing commercial opportunities with the government (Barkemeyer et

al., 2018). De Villiers and Marques (2016) found that the rule of law positively influences environmental disclosure. Based on these arguments, we posit that:

H2. Ceteris paribus, rule of law has a positive effect on carbon disclosure.

In environments with more tariff barriers, firms are more dependent on relations with public institutions (Hall & Soskice, 2001), reducing the firm's interest in reaching the interests of other stakeholders. When governments become larger, they raise tariff barriers to finance increased spending (Hall & Thelen, 2009). In this perspective, it is common for companies to reduce their investments in voluntary activities (Graafland, 2019), such as carbon disclosure. In general, governments with lower tariffs for companies, have a more developed capital market, which favors foreign direct investment. Therefore, companies disclose more carbon information to reduce informational asymmetry between foreign and domestic investors. (Cai et al., 2019). Based on these arguments, we posit that:

H3. Ceteris paribus, the prevalence of non-tariff barriers has a positive effect on carbon disclosure.

The country's economic freedom can have a significant influence on environmental disclosure (Rosati & Faria, 2019) since, in freer liberal economies, new concepts and ideas are more easily spread, since there are fewer limitations imposed on economic agents (Hall & Soskice, 2001). In these economies, consumers have a greater influence on the behavior of companies and demand responsible behavior from the economic actors they are associated with (Christmann, 2004). Economic freedom can be a determining factor in carbon disclosure, because it reduces the effects of corruption in the country, encouraging companies to behave more ethically (Baughn et al., 2007). The study by Hartmann and Uhlenbruck (2015) found that in countries with greater economic freedom, companies disclose more environmental information as a way to replace the absence of government regulation concerning sustainability. Based on these arguments, we posit that:

H4. Ceteris paribus, economic freedom has a positive effect on carbon disclosure.

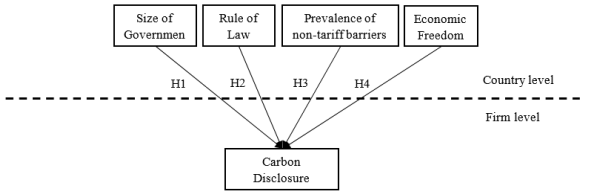

Figure 1. The conceptual framework.
Source: Own elaboration.

3. Empirical Design

3.1 Data

The initial sample was composed of the companies present on the Global 2000 list, from Forbes magazine (2020). A filter was made on this list, selecting only companies from the 20 countries that emit the most carbon into the atmosphere: China, United States, India, Russia, Japan, Iran, Germany, Indonesia, South Korea, Saudi Arabia, Canada, South Africa, Brazil, Mexico, Australia, Turkey, United Kingdom, Italy, France, and Poland.

Due to the unavailability of data, the final sample was made up of 1,328 companies from 19 countries, since no company in Iran discloses information in the Carbon Disclosure Project database. Our sample represents 66.40% of the population of the 2000 largest companies listed on the Global 2000 list, from Forbes magazine (2020). In this study, we examined the year 2020, because this year's information was available in the database where the data was collected. In addition, the data is the most current at the time the research was being conducted. Table 2 provides the number of companies by country.

Table 2: Number of companies by country.

Country	Total companies	Percentage	Cumulative percentage
Australia	30	0.02	0.02
Brazil	17	0.01	0.04
Canada	54	0.04	0.08
China	188	0.14	0.22
France	53	0.04	0.26
Germany	46	0.04	0.29
India	49	0.04	0.33
Indonesia	3	0.00	0.33
Italy	25	0.02	0.35
Japan	194	0.15	0.50
Mexico	11	0.01	0.51
Poland	2	0.00	0.51
Russia	19	0.01	0.52
Saudi Arabia	12	0.01	0.53
South Africa	10	0.01	0.54
South Korea	58	0.04	0.58
Turkey	6	0.01	0.59
United Kingdom	74	0.06	0.64
United States	477	0.36	1.00
Total	1328	1.00	

Source: Research data

Table 2 shows that the United States is the country with the highest representation with 477 companies, which corresponds to 36% of the sample. Japan ranks second with 194 companies, that is, 15% of the sample, followed by China with 188 companies and 14%. On the other hand, Indonesia and Turkey have only three and six companies respectively, with information available in the Carbon Disclosure Project database. Poland has the lowest representation, as it has only two companies in the sample.

The international companies in the final sample operate within eleven industries, as shown in Table 3. The data reveal that the industries with the greatest representation are financial, industrial, and consumer discretionary with 22%, 15%, and 12%, respectively. In contrast, the industries with the lowest representation in the sample are communication services, energy, and real estate with 69%, 64%, and 49%, respectively. The industry classification used in this research is based on the Forbes industry classification.

Table 3: Number of companies by industry.

Industry name	Total companies	Relative percentage	Cumulative percentage
Communication	69	0.05	0.05
Consumer discretionary	158	0.12	0.17
Consumer staples	99	0.08	0.25
Energy	64	0.05	0.29
Financials	294	0.22	0.52
Health care	90	0.07	0.58
Industrials	194	0.15	0.73
Materials	114	0.09	0.82
Real Estate	49	0.04	0.85
Technology	121	0.09	0.94
Utilities	76	0.06	1.00
Total	1328	1.00	

Source: Research data

3.2 Variables

The dependent variable is the disclosure of companies' carbon (CARDIS). The information for this variable was obtained through the Carbon Disclosure Project database. Depending on the level of disclosure of carbon, companies obtain a letter. For example, companies with greater transparency in relation to carbon emissions receive the letter A+ and companies with less transparency receive the letter F. In this study, we follow the study by Kouloukoui et al. (2018) and Giannarakis et al. (2018), and assign a grade for each of the letters.

The independent variables represent the categories of economic freedom, according to the study by Graafland (2019): (i) size of government; (ii) rule of law; (iii) open markets, and (iv) freedom from government regulation. The data for these variables were obtained through supranational organisms. The government's size was extracted from the Fraser Institute. The rule of law variable was extracted from the World Bank's Governance Indicators. The prevalence of non-tariff barriers was extracted from the World Economic Forum's The Global Competitiveness Reporting. The Index of Economic Freedom was extracted from the Heritage Foundation. Table 4 presents the study variables, description, source, and level.

Table 4: Variable's description.

Variable	Definition	Source	Level
Carbon disclosure	Carbon disclosure level, ranging from A + (greater transparency) to F (less transparency). A score was assigned to each letter, ranging from 100 (highest transparency) to 1 (lowest transparency), according to Kouloukoui et al. (2018).	Carbon Disclosure Project database	Firm
Size of government	This variable is the average per country of five sub-indicators: government consumption, transfers and subsidies, government investment, top marginal tax rate and state ownership of assets. It ranges from 0 (minor government) to 10 (major government)	Fraser Institute	Country
Rule of law	This variable measures the perception of the extent to which agents trust and abide by the rules of society, ranging from -2.5 (worst rule of the law) to +2.5 (best rule of the law).	World Bank	Country
Prevalence of non-tariff barriers	This variable measures the complexity of a country's tariff regime, ranging from 0 (high incidence of tariffs in the market) to 7 (lowest incidence of tariffs).	World Economic Forum	Country
Index of Economic Freedom	This variable measures the impact of freedom and open markets for each country, ranging from 89.4 (greater economic freedom) to 4.2 (less economic freedom).	Heritage Foundation	Country
Generalized Trust	Dummy variable ranging between 1 (if the company operates in a country where community has a high level of generalized trust in society/institutions) and 0 (otherwise).	Fainshmidt et al. (2016)	Country
Profits	Annual Profit means the current year pre-tax profit before the deduction of the staff remuneration and director remuneration.	Forbes (2020)	Firm

Source: Research data

As control variables, our study selected two variables: generalized confidence and annual earnings. The first variable is at the country level and has been inserted to confirm the rule of law variable. The study by Ortas et al. (2019) found that when firms are operating in a society where people trust institutions, companies are more likely to be more transparent in their environmental practices. The second variable has been widely used in other studies, showing that greater financial performance influences firms to have a more complete carbon disclosure. (Ben-Amar et al., 2017; Charumathi & Rahman, 2019; Liao et al., 2015).

3.3 Research model

After its collection, the data were submitted to descriptive statistics, considering the main measures, for example: mean, standard deviation, minimum and maximum. In addition, we operationalized the correlation analysis of the variables analyzed using Pearson's coefficient. As theoretical assumptions for performing hierarchical regression, we operationalized the Shapiro-Francia W test to test the normality of the data, the analysis of the Variance Inflation Factor and Tolerance for multicollinearity, and finally the Breusch-Pagan and White test to confirm or not the hypothesis of heteroscedasticity. Each of the hypotheses was tested using regression data models.

To test our hypotheses, we run the following model:

$$CARDIS_i=\beta_0+ \beta_1\ SIZGOV_i+\beta_2\ RULLAW_i+\beta_3\ OPEMAR_i+\beta_4\ ECOFRE_i+\beta_5\ GENTRU_i+\beta_6\ PROFITS_i+\omega_i$$

Where the subscript "i" represents the firm, "ß" is the estimated parameter, and "ω" refers to the error term. We perform a hierarchical regression, in which the dependent variable is the disclosure of carbon, and the independent variables represent the degree of economic freedom of the countries. To control for this effect, we add two control variables: generalized trust and annual profits. Hierarchical regression was chosen since panel data regression is used for samples of companies that vary over time.

4. Results

4.1 Descriptive analysis

In Table 5, we provide the main statistics for all variables used in this study. The data show that for the 19 countries, the mean of carbon disclosure variable is equal to 50.92, indicating that companies, in 2020, disclosed 50.92% of the total 100%. Moreover, the disclosure of carbon has a standard deviation (SD) of 42.02, a minimum of 1, and a maximum of 100. In other words, in our sample, there was a company that disclosed only the minimum of information and companies that were quite transparent about their disclosure of the carbon.

Table 5: Descriptive statistics.

Variável	Observações	Média	Desvio	Mín	Máx
CARDIS	1328	50.92	42.02	1.00	100
SMAGOV	1328	6.50	1.01	4.57	8.69
RULLAW	1328	1.11	2.12	-0.72	73.3
OPEMAR	1328	4.73	0.26	3.40	5.30
ECOFRE	1328	71.46	7.57	53.7	82.6
GENTRU	1328	0.74	0.50	.0.00	10.0
PROFITS	1328	50.15	1214.15	-0.98	44256

Source: Research data

Focusing on the four independent variables, government size (SIZGOV) is 6.50 out of 10 and with an SD of 1.01, rule of law (RULLAW) is 1.11 out of 2.5 and with an SD of 2.12, open markets (OPEMAR) is 4.73 out of 7 and with an SD of 0.26, economic freedom (ECOFRE) is 71.46 out of 89.4 and with an SD of 7.57 and generalized trust (GENTRU) is 0.74 out of 1 and with an SD of 0.50. The mean annual profit (PROFITS) is equal to 50.15.

4.2 Bivariate correlation analysis

Table 6 reports the results of the bivariate correlation analysis. The analysis shows that, between carbon disclosure and other variables, there is a direct linear correlation, significant at the 1% level. Only annual profits do not have a direct and significant linear correlation with carbon disclosure. The data reveal that no Pearson coefficient of the correlations between carbon disclosure and explanatory variables has a strong correlation.

Table 6: Correlation matrix.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CARDIS (1)	1.00						
SMAGOV (2)	0.18***	1.00					
RULLAW (3)	0.10***	0.12***	1.00				
OPEMAR (4)	0.18***	0.39***	0.70***	1.00			
ECOFRE (5)	0.30***	0.62***	0.91***	0.77***	1.00		
GENTRU (6)	0.34***	0.37***	0.72***	0.71***	0.78***	1.00	
PROFITS (7)	-0.02	-0.04*	0.93***	-0.01	-0.02	0.50***	1.00

***p<0.01.*p<0.10

Source: Research data

Multicollinearity concerns can also be checked by calculating the correlation matrix. In general, Person's coefficients have values below 0.80, only one coefficient has a value above 0.80, which is the correlation between rule of law and economic freedom. Although most of the coefficients have significant values, they have weak and moderate correlations. Therefore, multicollinearity is not a problem in our analysis.

4.3 Analysis of Normality, Multicollinearity, and Heteroscedasticity

As multicollinearity and heteroscedasticity can threaten the validity of the regression results, we have operationalized tests as part of the estimation procedures. Table 7 presents the results of the tests. The Shapiro-Francia test for normality was performed for each variable. The data shows that the alpha level chosen is greater than the p value. Thus, we can accept the null hypothesis of normality that our data is normally distributed.

Table 7: Normality, multicollinearity, and heteroscedasticity tests.

Variable	W'	z	Prob>z	VIF	Tolerance	Breusch-Pagan test
CARDIS	0.88	10.70	0.00			chi2(1) = 8.66
SIZGOV	0.95	8.40	0.00	1.96	0.51	Prob>chi2 = 0.0033
RULLAW	0.15	15.39	0.00	8.92	0.11	
OPEMAR	0.86	11.04	0.00	2.97	0.33	White's test
ECOFRE	0.85	11.25	0.00	11.52	0.08	chi2(25) = 199.62
GENTRU	0.86	11.17	0.00	3.66	0.27	Prob>chi2 = 0.0000
PROFITS	0.01	15.75	0.00	1.00	0.99	

Source: Research data

We applied the Variance Inflation Factors (VIF) test to investigate possible collinearity interference in the results, in addition to the correlation matrix. The data show values less than 10, an acceptable standard of collinearity. For tolerance, the data must be close to zero and less than 1, which was found in our analysis. Breusch-Pagan and White's test of heteroscedasticity indicates that variables reject the heteroscedasticity assumptions since the prob>chi2 is less than 0.05.

4.4 Multivariate analysis

Table 8 presents the results of the hierarchical regression. In this model, all independent and control variables were inserted. In addition, we analyzed all the companies in the sample. The data reveal that only the size of the government variable was not significant.

Table 8: Multivariate analysis results

Model 1 - All companies			
Independent variables	Coef.	Std. Err.	t
SIZGOV			
RULLAW	1.282	1.372	0.93
OPEMAR	20.849***	3.907	5.34
ECOFRE	-36.997***	6.460	-5.73
Control variables	-1.103***	0.446	-2.47
GENTRU			
PROFITS	39.492***	4.338	9.10
Number of obs.	0.387***	0.046	8.28
Prob>F		1327	
R-squared		0.0000	
Adj R-squared		0.2581	
Adj R-squared		0.2548	

***p<0.01.

Source: Research data

In Table 8, the rule of law variable (RULLAW) provides a positive sign, that is, in countries with a greater rule of law, companies tend to have a more transparent disclosure of carbon. In other words, these results indicate that in countries where agents have confidence in the rules of society, there is quality in contracts and property rights, and firms are more engaged in the disclosure of carbon.

When people trust government rules, they are more likely to follow them. This can be expanded to carbon disclosure, showing that an environment lacking corruption, fundamental rights, security, regulatory enforcement, and civil justice favor carbon disclosure. In these institutional environments, it is more common for companies to be charged for better environmental performance.

The variable of the prevalence of non-tariff barriers (OPEMAR) has a negative effect on carbon disclosure. This means that the existence of tariffs in the market and greater participation of the government affect carbon disclosure positively. Thus, when companies operate in markets with a higher incidence of government on economic policy and the international market, they are more likely to disclose more information about carbon.

This finding shows that when there is a better government presence on economic issues, companies tend to have greater carbon disclosure. The government, in fact, aims not only at economic improvement but also considers the environmental and social pillars. Therefore, it is expected that in countries where the government has a greater presence, companies will be required to behave more responsibly, considering all stakeholders.

The data reveals that a country's economic freedom (ECOFRE) has a negative effect on carbon disclosure. The results indicate that companies that are headquartered in countries with a high degree of economic freedom are not the ones that have greater transparency in their disclosure of carbon. On the other hand, firms can engage more in carbon disclosure when governments are more present in the national economy.

Regarding the control variables, generalized trust (GENTRU) has a positive effect on carbon disclosure, confirming the findings for the rule of law variable. The firm's profits (PROFITS) also have a positive effect on carbon disclosure. Thus, companies with greater financial performance tend to have greater disclosure, since they have more stakeholders, who expect responsible action from these companies.

4.5 Additional analyses: excluding the USA and restricting the sample

Having evidenced the above results, we conduct some additional analyses by investigating different samples to reinforce the results obtained. Therefore, we operationalize Model 2, in which American companies were removed since the United States has a large sample of companies, which may skew the results. In Model 3, we exclude financial companies, as they comply with specific accounting rules. Table 9 presents the results of the additional tests.

Table 9: Additional analyses results.

Variables	Model 2 - Excluding the USA			Model 3 - Excluding the financial firms		
	Coef.	Std. Err.	t	Coef.	Std. Err.	t
Independent variables						
SIZGOV	10.073***	1.633	6.17	0.204	1.607	0.13
RULLAW	20.226***	3.580	5.65	24.209***	4.748	5.10
OPEMAR	-21.741***	6.189	-3.51	-40.728***	7.905	-5.15
ECOFRE	-1.502***	0.411	-3.65	-1.126**	0.528	-2.13
Control variables						
GENTRU	42.081***	3.985	10.56	37.678***	5.726	6.58
PROFITS	0.345***	0.053	6.43	0.341***	0.053	6.44
Number of obs.		850			1035	
Prob>F		0.0000			0.0000	
R-squared		0.4047			0.2599	
Adj R-squared		0.4005			0.2556	

***p<0.01. **p<0.05.

Source: Research data

In Model 2, we can see that all variables were significant. The results found show that the size of the government has a positive effect on the disclosure of carbon, indicating that in countries where the government has greater influence, companies tend to have a more detailed disclosure of carbon. Economies with greater government participation positively affect the engagement of companies with the disclosure of carbon.

The analysis of the signals for the other variables does not change in Model 2 and Model 3. Therefore, these additional analyzes reinforce that in countries where agents have confidence in the rules of society, companies have greater disclosure of carbon. Furthermore, governments with greater regulation in the markets tend to have companies with greater disclosure of carbon. Finally, greater economic freedom negatively affects the engagement of companies with the disclosure of carbon. Table 10 summarizes the findings of the research.

Table 10: Expected and obtained signs for each one of the hypotheses.

Hypotheses	Expected Signs	Obtained Signs	Methods
H1	Negative	No significance	Hierarchical regression analysis
H2	Positive	Positive	Hierarchical regression analysis
H3	Positive	Negative	Hierarchical regression analysis
H4	Positive	Negative	Hierarchical regression analysis

Source: Research data

5. Discussion and Implications

To summarize, in terms of predisposition, we find that firms disclose more information on carbon emissions in countries with less economic freedom and greater government participation in the economy. Additionally, we find that, in countries where the law is more enforceable, companies are more likely to have greater transparency regarding carbon disclosure. Regarding the control variables, our findings show that companies disclose more information about their carbon emissions when they are operating in countries with greater society trust in institutions. At the company level, we find that firms disclose more carbon information if they are more profitable.

In countries with a greater rule of law, companies have greater responsibility for the disclosure of carbon, according to previous studies (De Villiers & Marques, 2016; Marano & Kostova, 2016). In fact, in countries where agents trust the rules of society, they are more likely to follow them. For example, signatory countries to the Kyoto Protocol are expected to adopt rules to mitigate the effects of carbon emissions. Therefore, in countries with a greater rule of law, firms are more likely to follow national rules for reducing atmospheric emissions.

This assumption is supported by Coluccia et al. (2018), who suggest that if the national government invests in the formulation and implementation of environmental policy, firms perceive a stimulating situation and positively evaluate the possibility of investing resources in the disclosure of carbon. Cahan et al.

(2016) argue that, in countries where enforcement measures have been implemented, stakeholders will demand more information from companies.

In countries with more tariff barriers, companies are more likely to disclose more carbon information. In practice, this means that having a more open market is not a determining factor for the engagement of firms with carbon disclosure. Our results are in line with the findings of Graafland (2019), who states that in countries with more tariff barriers, companies tend to invest more in research and development, such as water reuse, and renewable energy, contributing to obtaining more economical and competitive products.

We find that the country's level of economic freedom has a negative effect on carbon disclosure. This contradicts the work by Hartmann & Uhlenbruck (2015), who argue that in economies that leave more freedom for the market, firms have a better relationship with other stakeholders. As a result, they could release more environmental information.

However, Graafland (2019) found that in countries with greater economic freedom, companies are less engaged in environmental disclosure. Companies will behave more responsibly when they operate in more regulated states (Campbell, 2007). The greater presence of the state may reaffirm international agreements signed by countries, such as the Kyoto Protocol and the United Nations Global Compact (Cheng et al., 2014). Therefore, greater government participation in economic activities can encourage the discussion of environmental issues within the business environment.

Concerning the control variables, the findings show that in countries where agents trust institutions and society more, companies tend to disclose more carbon information. This finding is supported by the study by Ortas et al. (2019), which states that in countries where confidence is lower, there are high levels of corruption and the state is inefficient. The firm's profitability has a positive influence on carbon disclosure, indicating that companies with higher financial performance invest more resources in disclosure. Previous findings support these results (Charumathi & Rahman, 2019; Liao et al., 2015). In fact, companies with more financial resources deal with a greater number of stakeholders and therefore seek to legitimize their actions with greater transparency in carbon emissions.

This paper represents several advances in the prior literature. First, our evidence confirms that certain national characteristics shape the behavior of companies about carbon disclosure. This result reinforces the theoretical foundations of the Varieties of Capitalism approach by finding that the country's economic freedom influences economic agents (Hall & Soskice, 2001). The performance of firms is not similar between countries, since the government in which they operate provides an institutional context that can facilitate the development of environmental policies at the company level.

Second, our findings provide a solid understanding of how the national context encourages carbon disclosure. Previous studies have shown that the rule of law and open markets influence environmental disclosure. However, the effect of two other variables (government size and economic freedom) has not been studied (Graafland, 2019). Thus, our study surpasses previous studies (Baughn et al., 2007; Coluccia et al., 2018; Graafland, 2019; Hartmann & Uhlenbruck, 2015) by analyzing the four dimensions of countries' economic freedom.

In a third advance on the prior literature, unlike prior studies, we focus on analyzing characteristics at the country level, since few studies examine the disclosure of carbon from an institutional perspective. Several previous studies have found determinants of carbon disclosure at the firm level, such as characteristics of corporate governance and financial performance of the firm. Therefore, the inclusion of these new variables in the carbon disclosure debate may encourage new research in the field to test other economic characteristics.

In addition to scientific contributions, our results also have practical implications. Managers must consider the dimensions of economic freedom when adopting carbon disclosure policies. Depending on the country where the company is located, carbon disclosure practices will vary. In countries, where there is greater state intervention in economic activities, firms must invest more financial resources in the preparation of more complete sustainability reports to achieve the expectations of stakeholders.

Finally, important implications for policymakers can be drawn from the analysis. In finding that generalized trust has a positive effect on carbon disclosure, our results suggest that national governments can invest in combating corruption, and this can improve the level of carbon disclosure. Our findings also suggest that government intervention in economic activities is necessary to establish minimum requirements and promote incentives for companies to mitigate their effects on climate change.

We emphasize that disclosure is of relevant importance and, according to Braga et al. (2011), social and environmental disclosure appears as a vehicle that facilitates communication between the community and the development of opportunities for change, creating democratic conditions for an open, close and transparent development. The practice of this type of accounting presupposes a connection on the part of companies with the responsibility, sustainability, and power of stakeholders.

6.Conclusions

This study aimed to examine how the country's level of economic freedom affects carbon disclosure. To achieve this goal, we analyzed the effects of four dimensions of economic freedom on the carbon disclosure of 1328 international companies, headquartered in the 18 countries that emit the most carbon into the atmosphere. We used the Variety of Capitalism approach as a theoretical lens to support our hypotheses.

We expected that, in general, the country's level of economic freedom would positively affect carbon disclosure. However, our evidence shows that only hypothesis 2 is confirmed. Our results reveal that the rule of law has a positive effect on carbon disclosure and that greater state participation in the economy and greater economic freedom have a negative effect on carbon disclosure. Therefore, we conclude that greater government intervention in the economy can direct companies to act more responsibly concerning their carbon emissions.

By analyzing these findings in the light of the Varieties of Capitalism, we can understand that corporate carbon disclosure is influenced by their interaction with institutional economic actors. Companies need to develop relationships with their external environment so that their performance can meet the needs of all stakeholders, such as customers, investors, managers, media, government, and NGOs. The findings indicate that a strong state can propose environmental regulations and act so that their firms, in addition to achieving the financial goals of shareholders, can look towards the need for information on carbon emissions from their stakeholders.

We analyze the four characteristics of economic freedom, showing that macroeconomic aspects can affect business behavior in carbon disclosure. Given the importance of carbon emissions for climate change, it has been relevant to investigate how certain governmental aspects can favor greater transparency in carbon disclosure. Countries that want their companies to have greater carbon disclosure can encourage them through a more regulated and more supportive institutional environment.

6.1 Study limitations and further investigation

In common with all research, our results should be treated with caution. We use the Carbon Disclosure Project database to measure the level of carbon disclosure. Future studies may measure this disclosure in another way or using other databases. Moreover, new research may find new evidence when considering a longitudinal analysis. We measured national characteristics across the four main dimensions of economic freedom, according to Graafland (2019). However, future investigations may find new theoretical frameworks to compose the national characteristics of the countries.

Additionally, future studies may expand our understanding of characteristics at the country level for the analysis of carbon disclosure in a group of more specific countries, such as emerging or African countries. Finally, we encourage further research to answer research questions that our study did not answer: (i) How does the level of corruption in national institutions affect carbon disclosure in developed and emerging countries? (ii) How can each of the stakeholders use carbon disclosure to achieve their expectations? (iii) What influence do countries' labor market configurations have on carbon disclosure? (iv) Do the differences in the financial market of liberal economies and coordinated economies affect carbon disclosure?

References

Akadırı, S. Saint, Alola, A. A., & Usman, O. (2021). Energy mix outlook and the EKC hypothesis in BRICS countries: a perspective of economic freedom vs. economic growth. *Environmental Science and Pollution Research*, *28*(7), 8922–8926. https://doi.org/10.1007/s11356-020-11964-w

Alazzani, A., & Wan-Hussin, W. N. (2013). Global Reporting Initiative's environmental reporting: A study of oil and gas companies. *Ecological Indicators*, *32*, 19–24. https://doi.org/10.1016/j.ecolind.2013.02.019

Baldini, M., Maso, L. D., Liberatore, G., Mazzi, F., & Terzani, S. (2018). Role of Country- and Firm-Level Determinants in Environmental, Social, and Governance Disclosure. *Journal of Business Ethics*, *150*(1), 79–98. https://doi.org/10.1007/s10551-016-3139-1

Barkemeyer, R., Preuss, L., & Ohana, M. (2018). Developing country firms and the challenge of corruption: Do company commitments mirror the quality of national-level institutions? *Journal of Business Research*, *90*(May), 26–39. https://doi.org/10.1016/j.jbusres.2018.04.025

Batistella, A. J., Dal Magro, C. B., & Mazzioni, S. (2021). Diferença entre Lucro Contábil-Fiscal: Interesses de Banqueiros e Políticos. *21º USP International Conference in Accounting*, 1–21.

Baughn, C. C., Bodie, N. L., & McIntosh, J. C. (2007). Corporate social and environmental responsibility in Asian countries and other geographical regions. *Corporate Social Responsibility and Environmental Management*, *14*(4), 189–205. https://doi.org/10.1002/csr.160

Ben-Amar, W., Chang, M., & McIlkenny, P. (2017). Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project. *Journal of Business Ethics*, *142*(2), 369–383. https://doi.org/10.1007/s10551-015-2759-1

Bonelli, B. V., & Robles Jr, A. (2013). Contabilidade Ambiental como ferramenta para o gerenciamento sustentável. *Revista Científica Hermes - FIPEN*, *9*, 19–38. https://doi.org/10.21710/rch.v9i0.100

Braga, C., Sampaio, M. S. A., Santos, A., & Silva, P. P. (2011). Fatores determinantes do nível de divulgação ambiental no setor de energia elétrica no Brasil. *Advances in Scientific and Applied Accounting*, *4*(2), 230–262. https://doi.org/10.14392/asaa.2011040205

Cahan, S. F., De Villiers, C., Jeter, D. C., Naiker, V., & Van Staden, C. J. (2016). Are CSR Disclosures Value Relevant? Cross-Country Evidence. *European Accounting Review*, *25*(3), 579–611. https://doi.org/10.1080/09638180.2015.1064009

Cai, W., Lee, E., Xu, A. L., & Zeng, C. (Colin). (2019). Does corporate social responsibility disclosure reduce the information disadvantage of foreign investors? *Journal of International Accounting, Auditing and Taxation*, *34*, 12–29. https://doi.org/10.1016/j.intaccaudtax.2019.02.001

Campbell, J. L. (2007). Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility. *Academy of Management Review*, *32*(3), 946–967. https://doi.org/10.5465/AMR.2007.25275684

Charumathi, B., & Rahman, H. (2019). Do Women on Boards Influence Climate Change Disclosures to CDP? – Evidence from Large Indian Companies. *Australasian Accounting, Business and Finance Journal*, *13*(2), 5–31. https://doi.org/10.14453/aabfj.v13i2.2

Cheng, B., Ioannou, I., & Serafeim, G. (2014). Corporate Social Responsibility and Access to Finance. *Strategic Management Journal*, *35*, 1–23. https://doi.org/10.1002/smj

Christmann, P. (2004). Multinational Companies and the Natural Environment: Determinants of Global Environmental Policy Standardization. *Academy of Management Journal*, *47*(5), 747–760. https://doi.org/10.2307/20159616

Coluccia, D., Fontana, S., & Solimene, S. (2018). Does institutional context affect CSR disclosure? A study on Eurostoxx 50. *Sustainability (Switzerland)*, *10*(8). https://doi.org/10.3390/su10082823

De Villiers, C., & Marques, A. (2016). Corporate social responsibility, country-level predispositions, and the consequences of choosing a level of disclosure. *Accounting and Business Research*, *46*(2), 167–195. https://doi.org/10.1080/00014788.2015.1039476

Dhanda, K. K., & Malik, M. (2020). Carbon management strategy and carbon disclosures: An exploratory study. *Business and Society Review*, *125*(2), 225–239. https://doi.org/10.1111/basr.12207

Fainshmidt, S., Judge, W. Q., Aguilera, R. V., & Smith, A. (2016). Varieties of institutional systems: A contextual taxonomy of understudied countries. *Journal of World Business*, *53*(3), 307–322. https://doi.org/10.1016/j.jwb.2016.05.003

Fransen, L. (2013). The Embeddedness of Responsible Business Practice: Exploring the Interaction Between National-Institutional Environments and Corporate Social Responsibility. *Journal of Business Ethics*, *115*(2), 213–227. https://doi.org/10.1007/s10551-012-1395-2

Frynas, J. G., & Yamahaki, C. (2016). Corporate social responsibility: Review and roadmap of theoretical perspectives. *Business Ethics*, *25*(3), 258–285. https://doi.org/10.1111/beer.12115

Gallego-Álvarez, I., & Quina-Custodio, I. A. (2017). Corporate Social Responsibility Reporting and Varieties of Capitalism: an International Analysis of State-Led and Liberal Market Economies. *Corporate Social Responsibility and Environmental Management*, *24*(6), 478–495. https://doi.org/10.1002/csr.1421

Garcia, E. A. da R., Carvalho, G. M. de, Boaventura, J. M. G., & Souza Filho, J. M. de. (2020). Determinants of corporate social performance disclosure: a literature review. *Social Responsibility Journal*. https://doi.org/10.1108/SRJ-12-2016-0224

Giannarakis, G., Zafeiriou, E., Arabatzis, G., & Partalidou, X. (2018). Determinants of Corporate Climate Change Disclosure for European Firms. *Corporate Social Responsibility and Environmental Management*, *25*(3), 281–294. https://doi.org/10.1002/csr.1461

Graafland, J. (2019). Economic freedom and corporate environmental responsibility: The role of small government

and freedom from government regulation. *Journal of Cleaner Production*, *218*, 250–258. https://doi.org/10.1016/j.jclepro.2019.01.308

Hall, P. A., & Soskice, D. (2001). Varieties of Capitalism: The institutional foundations of comparative advantage. In *Oxford University Press*. https://doi.org/10.4337/9781786439017.00020

Hall, P. A., & Thelen, K. (2009). Institutional change in varieties of capitalism. *Socio-Economic Review*, *7*(1), 7–34. https://doi.org/10.1093/ser/mwn020

Hartmann, J., & Uhlenbruck, K. (2015). National institutional antecedents to corporate environmental performance. *Journal of World Business*, *50*(4), 729–741. https://doi.org/10.1016/j.jwb.2015.02.001

Herrera-Echeverri, H., Haar, J., & Estévez-Bretón, J. B. (2013). Foreign direct investment , institutional quality , economic freedom and entrepreneurship in emerging markets. *Journal of Business Research*, *67*(9), 1921–1932. https://doi.org/10.1016/j.jbusres.2013.11.020

Hourneaux Junior, F., Galleli, B., Gallardo-Vázquez, D., & Sánchez-Hernández, M. I. (2017). Strategic aspects in sustainability reporting in oil & gas industry: The comparative case-study of Brazilian Petrobras and Spanish Repsol. *Ecological Indicators*, *72*, 203–214. https://doi.org/10.1016/j.ecolind.2016.08.007

Hsueh, L. (2019). Opening up the firm: What explains participation and effort in voluntary carbon disclosure by global businesses? An analysis of internal firm factors and dynamics. *Business Strategy and the Environment*, *28*(7), 1302–1322. https://doi.org/10.1002/bse.2317

Ioannou, I., & Serafeim, G. (2012). What drives corporate social performance the role of nation-level institutions. *Journal of International Business Studies*, *43*(9), 834–864. https://doi.org/10.1057/jibs.2012.26

Jensen, J. C., & Berg, N. (2012). Determinants of Traditional Sustainability Reporting Versus Integrated Reporting. An Institutionalist Approach. *Business Strategy and the Environment*, *21*(5), 299–316. https://doi.org/10.1002/bse.740

Kouloukoui, D., Gomes, S. M. da S., Marinho, M. M. de O., Torres, E. A., Kiperstok, A., & de Jong, P. (2018). Disclosure of climate risk information by the world's largest companies. *Mitigation and Adaptation Strategies for Global Change*, *23*(8), 1251–1279. https://doi.org/10.1007/s11027-018-9783-2

Liao, L., Luo, L., & Tang, Q. (2015). Gender diversity, board independence, environmental committee and greenhouse gas disclosure. *British Accounting Review*, *47*(4), 409–424. https://doi.org/10.1016/j.bar.2014.01.002

Marano, V., & Kostova, T. (2016). Unpacking the institutional complexity in adoption of CSR practices in multinational enterprises. *Journal of Management Studies*, *53*(1), 28–54. https://doi.org/https://doi.org/10.1111/joms.12124

Nekhili, M., Nagati, H., Chtioui, T., & Rebolledo, C. (2017). Corporate social responsibility disclosure and market value: Family versus nonfamily firms. *Journal of Business Research*, *77*(July 2016), 41–52. https://doi.org/10.1016/j.jbusres.2017.04.001

Ortas, E., Gallego-Álvarez, I., & Álvarez, I. (2019). National institutions, stakeholder engagement, and firms' environmental, social, and governance performance. *Corporate Social Responsibility and Environmental Management*, *26*(3), 598–611. https://doi.org/10.1002/csr.1706

Pinheiro, A. B., da Silva Filho, J. C. L., & Moreira, M. Z. (2021). Institutional drivers for corporate social responsibility in the utilities sector. *Revista de Gestão*, *28*(3), 186–204. https://doi.org/10.1108/rege-08-2019-0088

Pinheiro, A. B., Sampaio, T. S. L., Guimarães, D. B., & Rebouças, S. M. D. P. (2021). Effect of the Cultural System on Corporate Social Responsibility Disclosure in the Energy Sector. *Contabilidade Vista e Revista*, *32*(3), 217–241. https://doi.org/10.22561/cvr.v32i3.6924

Pucheta-Martínez, M. C., Gallego-Álvarez, I., & Bel-Oms, I. (2019). Board structures, liberal countries, and developed market economies. Do they matter in environmental reporting? An international outlook. *Business Strategy and the Environment*, *28*(5), 710–723. https://doi.org/10.1002/bse.2275

Rosati, F., & Faria, L. G. D. (2019). Addressing the SDGs in sustainability reports: The relationship with institutional factors. *Journal of Cleaner Production*, *215*, 1312–1326. https://doi.org/10.1016/j.jclepro.2018.12.107

Walker, K., Zhang, Z., & Ni, N. (Nina). (2019). The Mirror Effect: Corporate Social Responsibility, Corporate Social Irresponsibility and Firm Performance in Coordinated Market Economies and Liberal Market Economies. *British Journal of Management*, *30*(1), 151–168. https://doi.org/10.1111/1467-8551.12271