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APPLIED ECONOMICS OF ENERGY AND ENVIRONMENT IN SUSTAINABILITY

The corporate social responsibility challenge on financial performance: Portuguese business situation

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Abstract

According to the definition that the European Commission (2001) offered us, corporate social responsibility is a set of measures that an organization can adapt, to improve the well-being of its stakeholders and promote the balance of economic, social, and environmental performance. The stakeholder theory clarifies that this decision-making must take into consideration all groups of people, being the only way of having a proportional benefit. Based on this premise, in this study, we intend to unravel the main determinants of corporate social responsibility in 63 Portuguese companies. To accomplish that, we used panel data, withdrawn from the SABI database, in the period comprehended between 2008 and 2018, applying the Probit model and the dynamic GMM for robustness check. The sample is composed of 42 companies that find themselves listed in the Portuguese stock exchange and 21 that do not. We can verify that the outcomes allow the analyses of nine variables, among them, only the audit, the asset rotation ratio, the debt ratio, the size, age, and financial autonomy show themselves as statistically positive in the implementation of corporate social responsibility practices. Even though the outcomes were not what we initially predicted, they revealed the positive impact of such practices. We consider them necessary and a reality that companies should pursue, even for the gains of capital that it might represent. We firmly believe that being socially responsible constitutes an essential practice from which all of us can benefit, contributing to life improvement in the community and for environmental sustainability.

Keywords Corporate social responsibility · Financial performance · Portugal · Panel data · Probit model

Introduction

Oliveira (2005) states that corporate social responsibility (CSR) is the way companies act in and interact with the environment. According to De Bakker et al. (2005), this is a field of study in constant development. Holanda et al. (2012) emphasize that CSR matches the set of strategies companies should adopt, under their social needs, aiming at profiting and reaching customer satisfaction. CSR is in line with the stakeholder theory, according to which, the companies' decision-making should take into account all of the individuals that relate to it, namely, staff, customers, government, and investors. Freeman (2010) affirms that the stakeholder theory covers any group or person that may affect, or be affected by, the company's goals, whose purpose is creating benefits for them and keeping their survival. Silva et al. (2013) emphasize that the global market has demanded the right conduct by the companies, i.e., an ethical and transparent behavior, focused on the environmental and social aspects to reach sustainable economic development.

The goal is to foment a better understanding of CSR, focusing on its largest valuation. We will specifically study how CSR impacts the financial performance of Portuguese companies. For that, 63 companies were used as a sample to distinguish if in Portugal it is necessary to make a

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greater investment regarding CSR and if the current efforts embarked upon are sufficient, taking into consideration the geographic dimension and economy, as well as assessing the main explanatory factors. Lastly, what may be done to change/improve the established reality is to be accessed. Our contribution comes true in a new analysis, which includes the financial autonomy, the asset rotation ratio, and the return on sales variables as these are seen as crucial to CSR practices. We added them to the variables already mentioned by other authors, which we will also focus on (they are audit, age, debt ratio, return on equity, profit growth rate, and size). For those, we followed the variables, methodology, and recommendations from De Lira Avelino et al. (2017). Likewise, what makes the difference is that this analysis distinguishes listed companies and non-listed companies and compares the impact of each one of these variables in these two subsamples that were added to our model.

Nowadays, sustainable corporate success cannot be achieved only by maximizing short-term profits but should target the market through responsible behavior. This is how CSR is gaining much more attraction in companies (KPGM 2008). Furthermore, the European Commission (2002) notes that economic growth and competitiveness can be stimulated, while environmental protection is ensured, and social responsibility is fostered. It is fundamental to analyze what drives CSR and subsequently to observe the main results through a panel data methodology given the nature of our sample. Furthermore, the use of panel data models is essential in the setting provided the binary nature of the dependent variable. Thus, this study will start with the literature review in the second section followed by the explanation of the sample and the database in the third section. The fourth section presents the methodology we used, i.e., the model applied to the study (Probit model), the panel data sample, and the analyzed variables. In the fifth section, we analyze the results, and, finally, in the sixth section, we present the conclusions, as well as the restrictions and recommendations regarding future research.

Literature review

What is meant by corporate social responsibility

Specifying CSR can be a complex process. Generally, one may say that its meaning has been changing, mainly in recent years. In the past, it was about reducing social impacts, but nowadays, it is all about what should be done for society, and companies are included in the latter (Schwartz and Carroll 2008). More specifically, some authors argue that companies are obliged to achieve profits within ethical and legal limits (Friedman 2007). However, other authors think that companies face a set of more specific demands towards society (Carroll 1979; McWilliams and Siegel 2001). According to McWilliams and Siegel (2001), CSR involves the daily actions which drive us towards social welfare, considering, among others, the company interests, which are, generally, required by law. Thus, the authors favor the voluntary action of social responsibility. Carroll (1979) and Whitehouse (2006) disclose that the concept of CSR has been, throughout the years, a subject of particular consideration and that does not exist a consensus regarding its concrete meaning. Therefore, it presents a long and diverse approach (Carroll 1999). However, Irigaray et al. (2013) assure CSR is directly related to the sustainable development of companies, where its activities cannot, in any way, affect negatively the environment and society in which they are included. Silva et al. (2013) argue that CSR is manifested, mainly, by its nature of a legal obligation. From another standpoint, it can also be understood as the responsible behavior of the company, regarding the way it acts ethically and socially. Consequently, two views of social responsibility come up.

Regarding the evolution of the concept, the 1990s are remarkable, though, as they brought concepts like a social response, social performance, and corporate citizenship (Carroll 1999). The meaning of social responsibility is the obligation of an entity to contribute towards the community to improve the quality of life and the environment. In turn, social performance is about the social mission of the organization. Lastly, corporate citizenship is about the set of principles and management systems intended to create and/or preserve value towards society. Therefore, corporate citizenship states that companies should act in a socially responsible way, fomenting the sustainable development of the economy and society in the long run. Wood (1991) reshaped the model of CSR, intending to create a more coherent theoretical framework, capable of linking the principles regarding CSR at an institutional level, as well as at individual and organizational levels. With this in mind, several nomenclatures arise concerning CSR, like business ethics, stakeholder management, sustainability, and corporate citizenship. Regarding possible limitations of the concept, Schwartz and Carroll (2008) underline that it does not comprise answers (corporate social responsiveness) nor results (corporative social performance). Nevertheless, Carroll (1999) believes that social responsibility can capture most relationships that companies have with society. Carroll (1991) told us that CSR needs four essential categories to its execution. Regarding a pyramid model, the first plan is occupied by philanthropic responsibility which is the capacity of a company in contributing to the community and improving the quality of life. Afterward, it is the ethical responsibility which is the obligation of doing what is right and fair, always avoiding possible damages. In the third place, we have legal responsibility which is associated directly with abiding by the law. Finally, but no less importantly, the last category

is about economic responsibility, related to the profit of the company and the services and goods it provides to society.

The goal will always be the profitability of the companies, and it is crucial they reach a profit, under the legal responsibility, while reflecting with ethical responsibility and the concerns and expectations of clients, consumers, collaborators, shareholders, and community. They also must contribute actively, with philanthropic responsibility, to improve the quality of life of the community (Carroll 2000; 2004). Therefore, Carroll (1979) affirms CSR is a set of economic, legal, ethical, and philanthropic expectations from all organizations that comprise society. This graphical representation of the categorization of the concept came to be known as the "pyramid of corporate social responsibility," which continued use during Carroll's (1991) research has become, according to Schwartz and Carroll (2003), the leading model of CSR. However, Schwartz and Carroll (2003) presented some limitations to the aforementioned pyramid model. The authors argue that using this type of model creates unintentional hierarchies between the categories, devaluing always the last one and vice versa. Moreover, they consider the philanthropic role is confusing and inclusively unnecessary as an element separated from the model, since these activities are not responsibilities, becoming complex to distinguish them from the ethical responsibility. Hence, the authors alert us for the incomplete theoretical development of the ethical, economical, and legal model of Carroll (1991). Alternatively, they propose the three-domain model of CSR, which comprises three generally defined types of responsibility and is consistent with Carroll's pyramid model. Considering this graphical representation, the pyramid is, in this case, replaced by a Venn diagram, so that none of the responsibilities is more important than the other and none is devalued.

Although defining it is not easy, due to several variables, we believe it is important to distinguish the meaning of socially responsible behavior. On one hand, socially responsible behavior should not compromise the environment and society. On the other hand, this behavior comprises stakeholders' expectations, despite not respecting that commitment (Campbell 2007). This concept varies per the adopted perspective and the objectivity or subjectivity of the selection criteria. Carroll (1983) teaches us that being socially responsible implies profitability and abiding by the law matches the mandatory variables in discussing the company's ethics and support for society. According to the World Business Council for Sustainable Development (2000), the goal of CSR is to recognize the value of engaging and communicating with the stakeholders. Accordingly, Mohr et al. (2001) define social responsibility as a company's direct commitment to minimize or deleting the negative results of its activities, thus maximizing the impact. This definition entails that a socially responsible company should consider the effect of its actions regarding the interested party. In 2005, Mohr and Webb (2005) clarified that socially responsible companies should adopt management strategies supported by the stakeholder theory.

Oliveira (2005) mentions that the practices of social responsibility are disclosed through social balances and annual reports and, recently, sustainability reports, whose purpose is to get the needed legitimacy regarding the organization's environment. Freeman and Moutchnik (2013) believe sustainability reports should be published by the company so that stakeholders can have access to them to infer the way the company engages with its staff and the society in which it is inserted. The clearest definitions regarding the meaning of CSR are based on Alexander Dahlsrud's (2008) article. According to the World Business Council for Sustainable Development (2000, referred by Dahlsrud 2008), CSR matches the companies' commitment to foster economic development and improve the quality of life of workers, local community, and general society, as sustainably as possible. For the European Commission (2001), CSR is about the company's voluntary decision in contributing to a better society, integrating social and environmental concerns all over its business. According to the Global Corporate Social Responsibility Policies Project (2003, referred by Dahlsrud 2008), CSR can be understood as a business practice based on ethical and respectful values towards workers, society, and the environment. Likewise, the International Business Leaders Forum (2003, referred to by Dahlsrud 2008) mentions transparent business practices, achieved by an action that considers ethical values and respects workers, society, and the environment, because by doing so the businesses can achieve sustainable development. The Business for Social Responsibility (2003, referred by Dahlsrud 2008) mentions the same regarding the purpose of CSR, namely, reaching an economic development, precisely in the same way. The Strategies (2003, referred by Dahlsrud 2008) highlights that CSR implies the meeting of present-day needs, without compromising the future generations. The business should contribute to sustainable development, and focus should be targeted to achieve economic, social, and environmental integration.

The European Commission (2003) concludes that only by having a continuous commitment to adopting a behavior as righteous and responsible as possible — what CSR stands for — the companies will be able to contribute to economic development and improve the quality of life and the welfare of workers and society. It should be noted that, based on Esrock and Leichty (1998), and considering the concepts previously mentioned, the fundamental and confluent elements that narrow CSR are related to respecting the staff, practicing righteous and transparent business, carrying about social concerns, and promoting environmental and sustainable practices. To conclude, Barauskaite and Streimikiene (2021) provide us with a literature review about corporate

social responsibility and financial performance of companies, by presenting the puzzle of concepts, definitions, and assessment methods. The authors conclude that in most studies, the positive or neutral relationship between CSR and financial results was claimed, whereas in most, the negative and alternative connections between these issues are less frequently identified. Also, Velte (2021) provides a recent literature review about CSR.

The impact of corporate social responsibility on company performance

In 1998, Stanwick and Stanwick tested the quality of CSR of a company using three variables: size, financial performance, and environmental performance. For this purpose, they used empirical data regarding the period between 1987 and 1997 and concluded that those variables affect the results regarding the quality of companies' CSR policies. Later, Moreira et al. (2003) addressed the state of CSR in Portugal, without losing sight of the relationship with the stakeholders, the European Union's role, and the reasons why companies put more value in Spain's quality of life. Now, regarding the relationship with stakeholders, which we will focus on, Portuguese companies showed they understand the needs of clients, as far as carrying out activities regarding citizenship and philanthropy that aimed at benefiting society. In that same year, Sen and Bhattacharya (2003) noted that the client's identification with the ideologies of the company is a great benefit. It is a good starting point, as the client will be loyal to the company and, probably, will not point out a negative opinion about it. Previously, the authors had mentioned in a 2001 study (Sen and Bhattacharya 2001) that it is most likely that consumers give a favorable response to a company's CSR practice if they conform to it. More recently, Baskentli et al. (2019) and Hofenk et al. (2019) confirmed that the consumer is more interested in initiatives that he identifies with.

Although most of the studies, like the one from Margolis and Walsh (2001), agree that it exists a positive and significant relationship between CSR and financial indicators, we know the monetary return from implementing socially responsible programs is lengthy and, sometimes, not guaranteed, wherefore the managers end up facing CSR as an expense (not as an investment) and thus, an obstacle. According to Martin (2002), every time a socially responsible action represents an expense borne by the shareholder, the managers tend to stay by his side. The author states that most of these behaviors are promoted to create value for shareholders and that the answer to society's expectations arises as a result because, otherwise, the companies lose money. Furthermore, Oliveira (2005) analyzed the 500 largest companies in Brazil to understand their social and environmental profile. The author noted that the largest companies are the ones that care most about disclosing their social balances. For instance, the companies of oil, gas, and electricity sectors are the ones that cause more social and environmental impacts and value social balances.

Santos et al. (2007) assess the practices used by small and medium enterprises (SME) and how they engage in socially responsible activities. Afterward, Orellano and Quiota (2011) examined the link between socially environmental investments and the performance of companies in 2001–2007, and they noted a relationship of coincidence between social investment and financial performance. Kaveski et al. (2013) researched the relationship between the economic–financial and socially environmental indicators of companies that supply electrical energy that was in the National Electric System Operator (ONS) in 2011. The authors determined that the companies were in similar positions regarding both indicators, which means that a greater financial performance entails a major socially environmental responsibility. More recently, De Lira Avelino et al. (2017) aimed at identifying the decisive factors of CSR in companies listed in the Brazilian stock exchange. They considered several variables, in particular, profitability, debt ratio, size, audit, leverage, and growth rate concerning the period between 2010 and 2016 and using a logistic regression method. They concluded that the profitability, size, audit, and leverage variables are positively related to CSR because they indicate if the company is socially responsible. The obtained results reaffirm what the literature clarifies regarding larger companies, if they have more leverage and profitability, they tend to adopt a behavior like this, as they manage more financial resources. The audit variable deserves a particular focus since it is about a transparency tool, whereby the audited companies by the Big Four have a higher probability of being socially responsible. Nevertheless, we must also highlight the lack of studies related to Portugal and that is the contribution we want to offer. Portugal becomes an interesting case study in this regard provided it is composed mainly of SMEs, which face financial difficulties, most of the time preventing them to do larger investments, turning harder CSR investments.

More recently, Fourati and Dammak (2021) explore both the direct and indirect effects of CSR on corporate financial performance using a sample of 3274 listed firms, considering the 2009–2016 period, from 25 countries located in Europe, Asia, Africa, and South and North America. OLS regressions were used to find that CSR has a positive and direct impact on financial performance and that corporate reputation mediates this relationship. As well, Le (2022) takes into account the effect of corporate image and reputation in their study of the effects of CSR on SMEs' performance. Also, Liu et al. (2021) explore the relationship between CSR and financial performance in the context of fintech technology, using a dataset of Chinese banks from

2009 to 2018. The results indicate that the interactive variable of CSR shows a nonsignificant influence on the returns on assets (ROA), returns on equity (ROE), and nominal interest margin profit. Using a sample of US tech firms, Okafor et al.'s (2021) results indicate that tech companies that spend more on CSR benefit from revenue and profitability increases. However, their results contradict those of previous authors by observing nonsignificant effects between CSR and Tobin's Q. Peng and Zhang (2022) study investigates the environmental sustainability performance (ESP) data of Forbes' listed multinational corporations through content analysis and applies stepwise regression models. Results evidence that board independence and board size positively affect ESP and the relationship between board independence and ESP in multinationals is negatively moderated by masculinity and uncertainty avoidance.

Corporate social responsibility in Portugal and the world

According to Maignan and Ralston (2002), several studies note that the meaning of socially responsible behavior varies from country to country. The work of Fourati and Dammak (2021) tries to highlight these differences in a cross-country study. We believe the differences may be based on the lack of comparative studies. It is the urgency of more research that fosters our work, mainly regarding the introduction and the practices of CSR in Portuguese companies. In the Portuguese corporate market, it is remarkable that the increasing introduction of environmentally, staff, and socially friendly policies yields capital gains. However, it is important to do a historical overview. At an early stage, most of the Portuguese companies had CSR as an informal practice, since the concept only appeared as an autonomous management subject years later during the European summit in Lisbon (Pinto 2004). The year 1998 saw the introduction of the National Economic and Social Development Plan, in which the meaning of CSR should be understood as the active growth of activities, the dynamism of social network adjusted to the exploration of natural resources, the ability of innovation of companies, and the quality of the educational and training systems.

We highlight some of the most important organizations that have been developing and supporting projects related to CSR for the companies. The Portuguese Institute of Quality (IPQ) provided the necessary requisites for a CSR management system. In 2008, this institute created the Portuguese Standard on a Management System of Responsibility, which aims at encouraging and guiding organizations for more socially responsible activities. They also highlight the Business Council for Sustainable Development (BCSD), the Group for Reflection and Support for Corporate Citizenship (GRACE), and the Portuguese Association of Corporate Ethics (APEE), responsible for the initiative "Práticas de Responsabilidade Social" (Practices of Social Responsibility) targeted to SMEs and the program "Ser PME Responsável" (Be a Responsible SME), created by the Institute of Support to Small and Medium Enterprises and Innovation (IAPMEI). Finally, CSR Portugal is a non-lucrative organization that aims to present itself as a national reference regarding CSR. For this purpose, it has released good practices and supported companies through the development of projects and instruments, which are essential for achieving that purpose.

Over the last years, the United Nations (UN) has been one of the entities that have contributed to the implementation of CSR. Over time, its achievement is visible and positive. We can emphasize four fundamental moments regarding sustainable development and international social practices. The Stockholm Declaration was published in 1972, at the United Nations Conference on Environment and Development, held in Stockholm, Sweden. This declaration consists of 26 common principles that should inspire governments and the general community to engage and drive efforts to preserve and improve the environment. The Brundtland Repor is, presented in 1987 by the World Commission on Environment and Development, a special commission created by the UN and headed by the Norwegian prime minister, Gro Harlen Brundtland, to reassess the environment and development. This document establishes sustainable development as a development model that meets the present-day human needs, without compromising the needs of future generations. The strategy of sustainable development should aim at harmonizing the welfare of society and the use of natural resources, i.e., economic development and environmental preservation. Later, in 1992, in Rio de Janeiro, Brazil, the United Nations Conference on Environment and Development, or Earth Summit, adopts Agenda 21,[1] a guiding document for every country so that they can adopt strategies aimed at their sustainable development. Lastly, the European Commission Green Paper, from 2001, accomplishes the purpose of promoting the reflection about CSR, to link the concept to the voluntary decision of the companies in contributing to a righteous and environmental friendly society, besides specifying that it manifests regarding the workers, as well as, generally, to every interested part of the company that might affect its results. This instrument also proves the companies

[1] The Agenda 21 Local is the local version of Agenda 21. It is a management instrument on the sustainability of each country. In Portugal, it was the *Agência Portuguesa do Ambiente* who presented, in 2007, the "Guia Agenda 21 Local – Um desafio para todos," which is a guiding methodology to implement local sustainability systems. Cf. https://apambiente.pt/index.php?ref=17&subref=120&sub2ref=163 e https://apambiente.pt/_zdata/Instrumentos/GestaoAmbiental/A21L/Guia%20Agenda%2021%20Local.pdf

have been aware that their social responsibility may take a direct economic value.

Practices of corporate social responsibility

It is important to understand the relevance of being socially responsible because the pressure to be like that is increasingly higher. According to McWilliams and Siegel (2001), this pressure is caused by, on one hand, the stakeholders (staff, vendors, community, government) and, on the other hand, by some shareholders. Santos et al. (2007) highlight the factors which influence the implementation of CSR practices which are, essentially, the ethical and social values of companies and the improvement of the relationships with the stakeholders. By reflecting on the main motivations that inspire socially responsible behavior, Maignan and Ralston (2002) distinguish three assumptions: the managers believe this behavior leads to an increase in the financial performance of companies; the managers themselves value this behavior; and the stakeholders put pressure on companies so they behave in a socially responsible way.

Regarding the implementation of CSR practices, it is important to emphasize that 60% of Portuguese companies listed on Euronext Lisbon assume they include the practices because they are fundamental and not as in a reputation way (KPMG 2008). Moreover, we find benefits related to these practices, which are linked to the adoption of socially responsible behavior. Investments in socially responsible activities yield, generally, internal benefits, since they provide development for the companies, not only regarding resources and know-how but also organizational culture. The external benefits are also highlighted, like the organizational reputation, which comprises the intangible and fundamental resources that might be created or improved as a direct consequence of introducing CSR practices.

Branco and Rodrigues (2006) tell that companies with good CSR reputations can drive the relationships with external individuals and attract more prestigious collaborators. Moreover, KPMG (2008) explains the main advantage in including CSR practices is about the companies' ability to improve their image in the eyes of the community, as well as their reputation, risk approach, and operational development. Regarding economic conditions, we believe poor financial performance results in lesser probabilities to consider the behaviors as socially responsible. We know that the relationship between competitiveness and social performance is more complex. The competitiveness effect is curvilinear, as moderate competitiveness will result in a higher probability of developing socially responsible practices. However, it should be noted that the corporate universe is not static; therefore, companies will always be subject to some pressures (Campbell 2007).

McWilliams and Siegel (2001) believe the ideal CSR level depends, invariably, on the size of the company, research, development, publicity, ability to diversify, consumers' demands, and market conditions. Santos et al. (2007) illustrate some of the factors that benefit the implementation of CSR practices in SMEs. For instance, and according to the Observatory of European SME from 2004, the mentioned authors affirm the positive and statistically significant relationship between the age of the company and the existence of socially responsible companies. Despite motives essentially cultural, the location stands out. In turn, a smaller company will have, unintentionally, more awareness of the benefits of implementing CSR practices. Therefore, the company's strategy constitutes a particularly relevant factor regarding CSR decisions. Barauskaite and Streimikiene's (2021) study provides us with a literature review about corporate social responsibility and the financial performance of companies, highlighting the puzzle of concepts, definitions, and assessment methods. Even more recently, Disli et al. (2022) investigate the effects of board attributes (board independence, gender diversity, board size, and board activity), on the sustainability performance of 439 publicly listed non-financial companies across 20 emerging countries throughout 2010–2019. They use environmental, social, and governance (ESG) performance scores to perform the study using the dynamic panel two-step system generalized method of moments estimator and to conclude that smaller, gender diverse, and independent boards that convene frequently achieve better sustainability performance, whereas no relationship was found concerning board size. It is important to notice that most of these studies use listed companies to perform their studies to the lack of available data for non-listed ones. Therefore, our first contribution is emphasized by the sample selected to perform the study.

Data

Data sampling and collection

The sample, which serves as the basis of this study, consists of 63 companies, of which 42 are listed in the Lisbon Stock Exchange, Euronext Lisbon (the remaining 21 are non-listed). At an early stage, we considered including every company listed in the Portuguese Stock Exchange, as well as the same number of non-listed companies, considering their activity sector. However, we encountered restrictions in terms of accessing information. So, it was necessary to rethink the information collection, especially regarding the available CSR information. We decided to only consider the companies founded and based in Portugal. At a subsequent stage, the weighted number decreased, due to finding limited or non-existent information in the database, SABI. The

absence of data for all the years in analysis resulted in the exclusion of some companies. Identically, other companies did not have the information filled out, regarding the studied variables; even the available data did not allow us to get the mathematical value of the analyzed variables, so we also excluded them from the sample. The list of all used companies in our sample may be found in Table 10 in the Appendix.

Faced with these setbacks, it was only possible to include 63 Portuguese companies in the sample that cover the three economic sectors, primary, secondary, and tertiary, as shown in Table 10 in the Appendix. Of the 63 companies, 42 are listed, and the remaining 21 are non-listed. The numbers of the subsamples are the ones that resulted from the limitations we had while determining the sample. It is important to mention that 17 of 42 Portuguese companies listed on Euronext Lisbon integrate the PSI-20, according to the Banco de Investimentos Global.[2] Because we intend to best assess the Portuguese business situation, we decided to individually study the subsamples and compare them, to understand if being listed affects the implementation of CSR practices (representing a novelty as compared to previous research).

We analyzed the period between 2008 and 2018 because we wanted the study to cover the years of the biggest economic crisis. The final year of the research is justified because several companies had not yet published the data from 2019 at the moment the paper was prepared, hence not having access to them. Thus, we observed a study of 11 years using annual data. We used the database, SABI, to retrieve the data regarding all variables we intend to observe, except the dependent variable — CSR — which is a binary variable (conditioning the model's choice). Regarding this variable, we retrieved its data by consulting sustainability reports, the companies' annual reports, and their websites. This means a company acknowledges CSR practices receive 1 value. The absence of these measures reflects 0 value, regarding each year of those analyzed. The same applies to the audit variable, which is also a binary variable. To that effect, if the companies are audited by one of the Big Four firms, they received the 1 value. The 0 value relates to the absence of an audit carried out by one of those companies. The Big Four firms must be mentioned due to their importance: this exclusive group of auditing and consultancy firms consists of *EY*, *Ernst & Young Global Limited*, *PwC*, *PricewaterhouseCoopers*, *Delloite*, *Delloite Touche Tohmatsu Limited*, and *KPMG*.

[2] Cf. https://www.big.pt/pdf/Newsletters/Resultados_e_Dividendos.pdf. Information accessed on September 2020.

Methodology

Econometric model: panel Probit model

To identify the decisive factors of CSR in the Portuguese business sector, we applied the panel Probit model. Furthermore, it is the most adequate one in the presence of binary dependent variables. As we clarified in the previous chapter, our study relies on two binary variables: the CSR dependent variable and the audit variable, which is one of the explanatory variables (not conditioning the model choice). The Probit model follows the reasoning of Eq. (1):

$$Y_{it} = \beta_0 + \beta_1 X_{1i}, t + \beta_2 X_{2i}, t + \cdots + \beta_k X_{ki}, t + u_{i,t} \quad (1)$$

with

$$P(Y = 1|X_1, X_2, \ldots, X_k) = \Phi(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k) \quad (2)$$

whereas Y_{it} is the explained or dependent variable, X_{kit} is the explanatory or independent variables, β is the coefficient associated with each of the independent variables, u_{it} is the error term, and Φ is the normal cumulative distribution function. We summarize, in advance, the variables, which are the subject of study of this paper, and the detailed information regarding their calculation formula is listed in Table 1.

More specifically, Y_{it} is a binary dependent variable, which gets the value 1, when the company has CSR practices, and the value 0 if otherwise; β_0 the constant term in our estimation; $\beta_{i,t}$ the estimated coefficients with $i = 1, \ldots, 9$ and $t = 1, \ldots, 11$, with i referring to the company and t to the period (the year); $AUD_{i,t}$ an independent variable, which represents the use of audit services during the period t — a dummy variable — that gets the value 1 when the company is audited by one of the Big Four firms and the value 0 if otherwise; $IDAD_{i,t}$ is the variable that represents the age of the company in the period t, as measured by the difference between the founding year and the period in analysis; $AUT.FIN_{i,t}$ being the variable that represents the company's financial autonomy during the period t; $ENDIV_{i,t}$ represents the variable that represents the company's debt ratio during the period t; $ROE_{i,t}$ stands for the variable that measures the company's return on equity during the period t; $CRESC.LUCR_{i,t}$ represents the variable that measures the profit growth rate during the period t; $DIM_{i,t}$ is the variable that represents the size of the company during the period t; $ROT.ATIV_{i,t}$ is the variable that represents the company's asset rotation ratio during the period t; and $ROS_{i,t}$ is the variable that measures the company's sales profitability during the period t.

In the beginning, the panel Probit model was estimated for 63 companies with different specifications, meeting the previous results of the tests done on the variables. Afterward,

Table 1 Dependent variable and independent variables

Variable type	Abbreviation	Definition	Formula
Dependent	CSR	Corporate social responsibility	"1" when the company has CSR practices; "0" if otherwise
Independent	AUD	Audit	"1" when a company is audited by one of the Big Four firms; "0" if otherwise
	AGE	Age	Ln (current year – foundation year)
	FA	Financial autonomy	Total equity/assets
	IND	Debt ratio	Total liability/total asset
	ROE	Return of equity	Net profit (RLE)/equity
	PGR	Profit growth rate	$(RLEano_t - RLEano_{t-1}) / RLEano_{t-1}$
	DIM	Size	Ln (total asset)
	ARR	Asset rotation ratio	Operational income/current asset
	ROS	Return of sales	Net profit/operational income

the same estimation was used, but the subsamples were only considered. The results were compared to analyze the differences and similarities.

Different specification models are also been included in the results.[3] For robustness check, both "difference" and "system" GMM dynamic panel estimators were used within the sample. The estimators are designed for dynamic small T (years) and large N (companies) panels that may contain fixed effects and separate from those fixed effects, idiosyncratic errors that are heteroskedastic and correlated within but not across individuals. The dynamic model System General Method of Moments (GMM) enables the explanatory variables to be treated as potentially endogenous or exogenous as well. It was chosen a two-step estimator, with a robust estimator of the covariance matrix of the parameter estimates. Thus, the resulting standard error estimates are consistent in the presence of any pattern of heteroskedasticity and autocorrelation within panels. The years have served as the set of variables for standard instruments, and all available lags of the specified variables in levels served as instruments for the transformed equation. The system GMM uses the contemporaneous first differences as instruments in the level equation. These defaults are appropriate for predetermined variables that are not strictly exogenous. Finally, pca option was selected in the dynamic model to replace the "GMM-style" instruments with their principal components to reduce the instrument count. Principal components analysis is run on the correlation, not covariance, matrix of the "GMM-style" instruments.

[3] We thank the reviewers for the valuable suggestions to include robustness test results.

Variables studied

Insofar as the variables used in this study showed major differences, we chose to apply the logarithm to some of them to ease their interpretation, as well as the analysis and comparison of the results. As previously mentioned, it was not always possible to export the variable we wanted to study from the database; hence, we used some calculation formulas to achieve the variable's result, if non-existent. Table 1 lists the calculation formula applied to each variable used. The software SATA, version 16, was used in all estimations.

Regarding the audit variable, Sulaiman et al. (2014) stated that companies with excellent reputations, like the Big Four, are not associated, generally, with clients with low levels of disclosure in their statements. Murcia and dos Santos (2009) and De Lira Avelino et al. (2017) highlighted that auditors can influence their clients, the companies, to turn the data they present more transparent, especially regarding social and environmental aspects. That is how the expected positive relationship between audit and CSR is reflected.

According to Santos et al. (2007), there is a positive and statistically significant relationship between the age of the company and the improvement of socially responsible activities. This result implies companies, which have been on the market the longest, should be a step ahead to keep the leadership. The older companies are financially more stable, hence more inclined to adopt new CSR practices. Even if they are more demanding financially, the stability factor enables companies to invest in new scenarios. We think that greater stability leads to more flexibility. On the other hand, the older companies must have increased social responsibility, as they are subject to more pressure on the ability to innovate and reinvent themselves, so they are not supplanted by the new conquests of the market.

As we mentioned before, poor performance results in lower chances of considering socially responsible behaviors. Therefore, we expect the opposite behavior from the

financial autonomy variable, since this one pertains to the ability of the entity to meet its financial commitments with its equity. We understand that greater financial autonomy will result in a bigger investment in CSR practices. Both Jensen and Meckling (1976) and Murcia and dos Santos (2009) believe, and based on the Agency Theory, business managers with a higher level of debt seek to comply with the creditors and the shareholders. For instance, we typically know that when it comes to environmental responsibility, the higher the amount of pollution in a company, the higher will be its costs. However, the company does not think of this as its main concern, as they focus on earning a profit by neglecting the way they achieve that. Sometimes, companies adopt CSR practices to mitigate less sustainable activities, thus meeting the interests of creditors and shareholders (Murcia and dos Santos 2009). Regarding the cost of capital, we know that more responsible companies, that view CSR practices as an investment (and not as an expense), tend to be benefitted. For instance, if certain environmental standards are met, they benefit from lower taxes. In this regard, we hope to find a positive relationship between the debt ratio and CSR.

Murcia and dos Santos (2009) underlines that more profitable companies tend to disclose more social information than less profitable companies. "More profitable" means a greater capacity to invest in more sustainable projects. De Lira Avelino et al. (2017) drew a similar conclusion. So, in respect of the return on equity variable, we also predict that it will have a positive relationship with the CSR variable. According to Lopes and Alencar (2010), the profit growth of a company is related directly to the sharing of social and environmental information, which aims at simplifying the analysis of external investors and thus allows it to stand out from other companies with lower projections for growth. We hope the behavior of the variable is positive, despite knowing De Lira Avelino et al. (2017) could not prove it.

We also mentioned that McWilliams and Siegel (2001) consider that the ideal CSR level depends invariably on the size of the company. Likewise, we know a smaller company will have, unintentionally, more awareness of the benefits of implementing CSR practices, based on Santos et al.'s (2007) work. Companies with major economic importance are expected to promote a greater commitment in their sustainability reports to implement CSR practices. The size is a determining factor of CSR, reinforcing our position that it will relate positively with that commitment to the stakeholders.

Regarding the return of sales (ROS) variable, we know the investment capacity turns out in proportion to the achieved sales quantity. Therefore, we understand that the more profit the companies get, the greater their involvement in CSR practices will be. Lastly, the asset rotation ratio measures the degree of efficiency with which a company uses its assets. The bigger the asset rate, the bigger the capacity of the company to generate sales will be. On this basis, and considering the expected behavior of return of sales, we also expect positive importance between the asset rotation ratio and the CSR variable.

Table 2 Descriptive statistics

Variable	Obs	Average	Standard deviation	Minimum	Maximum
CSR	693	0.7359	0.4412	0	1
AUD	693	0.3247	0.4686	0	1
AGE	693	3.2513	0.8401	0.0000	4.6052
FA	693	0.3142	0.8285	−5.4893	3.7283
IND	693	0.6845	0.8288	−2.7283	6.4893
ROE	693	−0.3679	9.4466	−240.7321	7.2567
PGR	693	0.2779	18.3215	−221.0166	300.3284
DIM	693	12.6869	1.7152	0.0000	17.1490
ARR	693	0.6156	19.7310	−513.3905	27.1213
ROS	693	0.4467	30.6242	−250.6935	652.9548

Note: see Table 1 for the description of the acronyms

Descriptive statistics

Table 2 lists the values of descriptive statistics of the variables under study. A brief analysis of the collected data allows us to understand that almost 74% (0.7359) of the observations are rated as socially responsible, while around 26% (0.2641) of the companies in our sample do not have CSR practices, at least, for a few years. Approximately 32% (0.3247) of our sample is audited by one of the Big Four firms, while around 68% (0.6753) is not. The age variable presents an average of 3.2513, resulting in a strongly positive value since the maximum value is 4.6052. The financial autonomy has a relatively low average of 0.3142. Therefore, we conclude that the company most likely to incur debt has higher values than the ones of companies with greater capacity of financial autonomy. This is something we believe is negative, as it reflects that if companies included in our sample needed to invest, most of them could not use external financing (for instance, a bank loan). The values of the debt ratio variable show the analyzed sample is comprehensive. The negative minimum value (−2.7283) means we found non-indebted companies, i.e., with financial autonomy, and the maximum value (6.4893) is the maximum debt achieved. However, the average is very close to zero (0.6845), which means that our sample includes companies with large gaps regarding debt levels.

Regarding the return on equity (ROE), it should be explained that it identifies with the return that companies achieve. Since the minimum and maximum values are −240.7321 and 7.2567, respectively, the average

Table 3 Test results of the *Shapiro–Wilk test*

Variable	Obs	W	V	z	Prob > z
CSR	693	0.9965	1.597	1.141	0.1269
AUD	693	0.9972	1.289	0.619	0.268
AGE	693	0.9429	25.821	7.928	0
FA	693	0.5804	189.614	12.791	0
IND	693	0.5804	189.599	12.79	0
ROE	693	0.0394	434.073	14.81	0
PGR	693	0.2245	350.445	14.288	0
DIM	693	0.9638	16.367	6.817	0
ARR	693	0.0511	428.806	14.781	0
ROS	693	0.1461	385.881	14.523	0

Note: see Table 1 for the description of the acronyms

of − 0.3679 means that the net results of our sample are mostly negative. The standard deviation of nearly 9.45 (9.4466) proves that this is the fourth variable with greater variability of the data around the average. The profit growth of the companies in the analyzed sample is reduced, as it is verified by the minimal value of the variable (− 221.0166). The average also proves it, since its estimated value is 0.2779. It should be noted that the standard deviation of 18.3215 is one of the highest among all the used variables to analyze the relationship between financial performance and CSR practices. The size variable reaches a positive high average of 12.6869, whereas its maximum value is 17.1490. The standard deviation of 1.7152 allows us to conclude that our sample includes medium-sized companies since this value is narrow in comparison to the average. One of the variables with a higher standard deviation is the asset rotation ratio variable, which value of 19.731 is the second highest value.

The asset rotation is relatively low, as the average of 0.6158 is within a value range that consists of the minimal negative of − 513.3905 and the maximum of 27.1213. Finally, the return of sales (ROS) variable has a similar behavior as the asset rotation ratio variable. The standard deviation of 30.6242 is the highest among all analyzed variables, which is understandable because this variable is affected by all the other variables.

Test of normality: Shapiro–Wilk and heteroscedasticity test — Breusch–Pagan

The Shapiro–Wilk test is used to verify the normality between variables. Table 3 presents the results of this test. The analysis of the table allows us to conclude that the CSR (prob > *z* 0.1269) and audit (prob > *z* 0.2680) variables have a normal distribution, which we believe is predictable because they are binary variables.

Table 4 Correlation matrix of Pearson and variance inflation factor (VIF).

	CSR	AUD	AGE	FA	IND	ROE	PGR	DIM	ARR	ROS	VIF
CSR	1										
AUD	0.220***	1									**1.55**
AGE	0.220***	0.061	1								**17.35**
FA	-0.088**	0.130***	-0.173***	1							**57.67**
IND	0.091**	-0.129***	0.179***	-0,999***	1						**86.32**
ROE	-0.031	0.032	0.001	0.017	-0.017	1					**1.01**
PGR	0.032	0.048	0.015	0.019	-0.019	0.016	1				**1**
DIM	0.282***	0.109***	0.100***	-0.000	0.013	0.098***	0.012	1			**62.19**
ARR	-0.029	0.031	0.129***	-0.052	0.052	-0.001	0.004	-0.017	1		**1.02**
ROS	-0.052	-0,082**	0.038	0.032	-0.032	0.016	-0.008	0.018	-0.001	1	**1.01**

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. See Table 1 for the description of the acronyms

The *Breusch–Pagan* test is applied to infer the presence of heteroscedasticity. From it, we know that $chi^2(9) = 32.57$ and prob > $chi^2 = 0.0002$, which allows concluding that the null hypothesis should be rejected, and, as such, it proved the presence of heteroscedasticity in our research. This evidence is important since heteroscedasticity may limit the study, in the sense that even if the variables present a positive impact, its presence implies that no result can be undertaken for sure but only in a predictable way. The use of the dynamic and system GMM models for robustness check is justified in this context.

Table 4 presents the correlation matrix and the values of the variance inflation factor (VIF). The correlation matrix shows the *p* values, which helps to analyze the statistical significance of the variables. The VIF values allow the existence of multicollinearity, and the information provided to the model is no longer exclusive. Highly correlated variables may harden the interpretation of the regression model. However, VIF helps to correct the issue, because it measures the correlation and its strength between the explanatory

variables. The correlation between the values of 1 and 5 is moderate, despite not being enough to affect the analysis of the model. If the value is higher than 5, the correlation between the variables and the model is high, making the estimated coefficients and the *p* values of the model not reliable.

Table 4 analysis allows us to conclude that most variables do not have statistical significance between them. The variables with a statistical significance of 1% are audit and CSR; age and CSR; financial autonomy and audit; financial autonomy and audit; financial autonomy and age; debt ratio and audit; debt ratio and age; debt ratio and financial autonomy; size and CSR, size and audit; size and age; size and return of equity, and, lastly, asset rotation ratio and age. The variables with a statistical significance of 5% are financial autonomy and CSR, debt ratio and CSR, and return on sales and audit. The remaining variables do not have significance between them.

One of the most significant cases is the correlation value between the debt ratio and the financial autonomy variables. It is set at − 0.9899, having a significance level of 1%. Therefore, the debt ratio and financial autonomy are inversely proportional. The variables with which the CSR dependent variable has a strong correlation are size (0.282), age (0.220), and audit (0.220). These three have a significance level of 1%. By interpreting the correlation values according to the scale between − 1 and 1, we note the weakest correlations are between the return of equity (ROE) and age (0.000), as well as between size and financial autonomy (− 0.0001), leading to both combinations without significance. On the other hand, the strongest correlations belong to size and CSR variables (0.292) and debt ratio and financial autonomy (0.999), leading to both possibilities with a significance level of 1%. The debt ratio has a negative correlation with the audit and financial autonomy variables. However, it has a positive correlation with age and CSR variables. The return of equity (ROE) and profit growth variables do not have a statistical significance with any variable. Lastly, the size variable correlates positively with the CSR, audit, age, and return of equity variables, while the asset rotation ratio variable only correlates positively with age, as does the return of sales (ROS) with audit, at a significance level of 5%.

Empirical results

In this topic, we intend to address the panel Probit model results initially, which were applied to the Portuguese business situation, concerning the period between 2008 and 2018. We have 693 observations related to the 63 companies with almost 11 years of available data, which we will analyze. Afterward, we present the results of the estimations for each of the two subsamples under analysis: the one that includes the 42 companies listed in the Portuguese Stock Exchange (with 492 observations) and the other that includes the 21 non-listed companies (with 231 observations). We will consider them individually to compare them.

Table 5 Panel *Probit* results

Variables	Coefficients	Coefficients	Coefficients	Coefficients
AUD	0.235***	0.181***	0.207***	0.235***
ROE	− 0.037	− 0.038	− 0.018	− 0.037
PGR	0.001	0.001	0.001	0.001
ARR	− 0.012*	− 0.003	− 0.012*	− 0.011*
ROS	− 0.0004	− 0.001	− 0.001	− 0.0003
IND	0.083***			
DIM		0.067***		
AGE			0.103***	
FA				− 0.081***
Constant	0.304***	− 2.416***	− 0.615***	0.573***
Observations	693	693	693	693
Prob > chi^2	0.000	0.000	0.000	0.000
Pseudo-*R*-squared	0.071	0.115	0.094	0.070

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. See Table 1 for the description of the acronyms

Table 5 has four estimations of the panel Probit model that correct the effect of multicollinearity, since the debt ratio, size, financial autonomy, and age variables have relatively high values of VIF. To justify, in the case of the debt ratio, size, and financial autonomy variables, as they consider the total asset in their calculation formula; also, it is believed the age variable is directly related to the size of the company. That is why the size variable represents the bridge of multicollinearity of the model. In the presented estimations, the coefficients relate to the value of the marginal effects, to interpret the model. The debt ratio, size, age, and financial autonomy variables were inserted individually to better interpret the model. However, the interpretation was not as predicted nor the ideal, since our best pseudo-*R*-squared is only 0.115.

The first estimation, in which the debt ratio variable was inserted, was significantly positive at 1%. So, was the audit variable. However, the asset rotation ratio variable had a positive significance of 10%. We did not check the significance of the remaining variables. The audit variable became the one that most affects CSR (0.235). However, we must not forget that we are facing an estimation with the second lowest pseudo-*R*-squared (0.071).

The estimation that involves the size variable has the highest pseudo-*R*-squared of all four estimations (0.115). Both the size and audit variables had a positive significance of 1%. Moreover, the audit variable stands as the variable that most affects the Portuguese companies' CSR (0.181). The specification of age and the one that includes financial

autonomy had a positive statistical significance of 1% (the same one as the audit variable). The positive behavior of the asset rotation ratio increases in both, reaching a significance level of 10%. If we compare the estimation of the debt ratio variable with the estimation of the financial autonomy variable, which are variables with an inversely proportional behavior, as mentioned before, we came across, in both variables, with the same coefficients for audit at a significance level of 1% and for asset rotation ratio (−0.012 and −0.011) at a significance level of 10%.

Generally, the return of equity (ROE), profit growth, and return of sales variables (ROS) are not significant regarding the implementation of CSR practices in Portuguese companies. On the other hand, the audit, debt ratio, age, size, and financial autonomy variables are significant to that decision-making. These first variables positively influence CSR practices, while the financial autonomy variable has the inverse behavior, despite being equally significant. With a lower significance, but not having the least importance, the asset rotation ratio variable was significant, except for the estimation that includes the size of the company. It should be noted that, since the pseudo-*R*-squared is very low and the phenomenon of multicollinearity and heteroskedasticity is present in the study, the variables could not have presented a more positive behavior than the one showed. Our variables behave somewhat distinctly in comparison to the ones from De Lira Avelino et al. (2017). The audit variable has inferior values; in our study, it is between 0.181 and 0.235, whereas the authors present the value of 0.893. Regarding the return of equity (ROE) variable, our results were negative, but the authors have a value of 0.249. The size variable is positive in both studies, despite the authors having higher levels. The profit growth variable was always positive in our study, but in the authors', it has a negative value (−0.005).

We understand that the values are a bit different since the studied model is not the same. Whereas De Lira Avelino et al. (2017) use the Logit model, our study uses the Probit model. The samples are also different; the authors have 2,106 observations, while our study was limited to 693 observations. Moreover, the Portuguese market is smaller than the Brazilian one (it should not be forgotten that the authors' sample includes Brazilian companies), so we have a less diversified market in our sample.

We will now focus on the two subsamples in the analysis, which were analyzed individually. Table 6 lists the results of the panel Probit estimation of the subsample that includes the 42 companies listed in Euronext Lisbon (with 492 observations).

In this analysis, we considered the variance inflation factor (VIF), just like we did in the first sample of 63 companies. Like the results obtained in the estimation of the first sample, the audit variable was significant at 1% in the four specifications. The return on equity (ROE) and profit growth rate variables also had the same behavior, because, in both the first sample and in this subsample, they were not significant. The reality is different regarding the asset rotation ratio. In the sample, this variable has a significant level of 5%/10%, when it is included in the specifications of the debt ratio, age, size, and financial autonomy variables. Namely, in this subsample, the variable has a statistical significance of 5% in the specifications of the debt ratio, age, and financial autonomy variables and 10% in the specification of the size variable. The return on sales (ROS) variable does not have statistical significance either in the first sample or in this subsample. Regarding debt ratio and financial autonomy variables, both variables are not significant in this subsample, while in the first sample they had a significance of 1%. The audit, size, and age variables have a statistical significance of 1% in this subsample.

It should be noted that the pseudo-*R*-squared are very low; however, they are higher than the ones in the first sample. Table 7 lists the results of the Probit estimation for the subsample that includes the 21 non-listed companies (with 231 observations). The audit variable, which was significant at 1% both in the estimation of the 63 companies' first sample and in the 42 listed companies subsample, now has a significant level of 10%. The specifications of the debt ratio, size, and financial autonomy variables have significance, but not in the specification of the age variable. Furthermore, the return on equity (ROE) and profit growth rate variables do not have significance, concluding that they are not significant in any of the three considered estimations.

Regarding the asset rotation ratio, the results are distinct throughout the observed estimations. If we analyze it against the results obtained in the estimation of the listed companies

Table 6 *Probit* results for the sample of listed companies

Variables	Coefficients	Coefficients	Coefficients	Coefficients
AUD	0.3191***	0.2483***	0.3084***	0.3191***
ROE	−0.0166	−0.0349	−0.015	−0.0162
PGR	0.0018	0.0016	0.0017	0.0018
ARR	−0.0180**	−0.0125*	−0.0195**	−0.0181**
ROS	−0.0004	−0.0004	−0.0005	−0.0004
IND	−0.0354			
DIM		0.0816***		
AGE			0.0502**	
FA				0.0441
Constant	0.2595**	−3.2986***	−0.2767	0.1342
Observations	462	462	462	462
Prob > chi^2	0.000	0.000	0.000	0.000
Pseudo-*R*-squared	0.1116	0.1879	0.1187	0.1121

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. See Table 1 for the description of the acronyms

Table 7 *Probit* results for the non-listed companies

Variables	Coefficients	Coefficients	Coefficients	Coefficients
AUD	0.1154*	0.1154*	0.0497	0.1154*
ROE	−0.0639	−0.055	−0.0468	−0.0639
PGR	−0.0001	−0.0003	0.0002	−0.0001
ARR	0.0209	0.0576**	0.0337*	0.0209
ROS	0.0017	0.0009	0.0021	0.0017
IND	0.3781			
DIM		0.0439***		
AGE			0.1347***	
FA				−0.0378
Constant	0.6730***	−1.9383**	−1.5235***	0.8411***
Observations	231	231	231	231
Prob > chi^2	0.2488	0.0160	0.0000	0.2488
Pseudo-*R*-squared	0.0400	0.0794	0.1704	0.0400

***$p<0.01$, **$p<0.05$, *$p<0.1$. See Table 1 for the description of the acronyms

subsample, we see the variable has the same behavior in the specifications that include size and age, as it is significant at 5% and 10%, respectively. However, it is not significant against the specifications of the debt ratio and financial autonomy variables. If we analyze the asset rotation ratio in comparison to the results obtained in the estimation of the first sample, the variable is significant in only two specifications but with different significance levels. The return on sales (ROS) has the same behavior in the three estimations and does not show statistical significance. Finally, regarding the four variables, which were inserted individually in the estimations, only the size and age variables showed statistical significance. The size variable has a significance of 1%, just like in the subsample of listed companies. However, the age variable, which had a significance of 5% in the estimation of the listed companies subsample, now is statistically significant at 1%. The debt ratio and financial autonomy variables not only had the same behavior but also did not show significant levels here.

The analysis of the listed companies (Table 6) and non-listed companies (Table 7) subsamples, which were considered and analyzed individually, provides us with an important conclusion; namely, the listing of companies may be considered as fundamental regarding CSR practices because we verified more variables with statistical significance in the listed companies subsample with a significance of 1% in 5 variables. On the other hand, the non-listed companies subsample only showed 2 variables with a statistical significance of 1.

For robustness check, the dynamic and system GMM dynamic panel estimators were applied for the overall sample. Results are presented in Table 8. It was not possible to present results for the individual listed and non-listed samples provided the results would become biased due to data limitations. As observed, there are a limited number of variables that present significant effects on CSR. Previous practices in the time of CSR end up contributing to more initiatives towards current levels of CSR practices implemented within the firm. Moreover, past profit growth negatively and significantly influences CSR practices within firms. Also, the past asset rotation ratio decreases the probability of implementing CSR by firms. As for indebtedness, it is only significant in current CSR practices when the dynamic system GMM panel is used with year dummies, influencing it significantly and positively, therefore increasing the implementation of corporate social responsibility strategies in the firm. The same is verified for financial autonomy which seems reasonable since firms with more own financial resources will have more liberty to invest in current CSR practices. Finally, we would like to emphasize the results obtained for the age variable. The current maturity of the firm influences negatively the CSR, but experience measured by years of activity in the firm positively and significantly influences the implementation of CSR practices allowing the firm to grow learning by doing.

As for financial performance, only past ROE results seem to positively influence the CSR implementation in a significant way when a debt, age, and dimension of the firm are taken from the estimations. Current ROS results positively lead to more CSR practices, but the past return on sales seems to decrease CSR practices in the present. Le (2022) defends a positive relationship between CSR and financial performance in a study conducted for Vietnam, but we are unable to validate these results considering the lack of significance in the Portuguese sample here explored. Moreover, we offer evidence regarding the results pointed out by Barauskaite and Streimikiene (2021), revealing that in most studies, the positive or neutral relationship between CSR and financial results was claimed, but lower importance is given to the negative and alternative connections between these issues. The authors highlight that they cannot be excluded from the analysis and require certain attention and further consideration. Our study reinforces this statement provided the results here presented and discussed.

Previous research was also more concentrated on the inverse relationship of the CSR effects over financial performance as Fourati and Dammak (2021). It was a broad study considering different companies from different countries all around the world, concluding by implementing OLS models that CSR has a positive and direct impact on corporate financial performance. Our present study does not analyze the inverse effect as we leave this study for future research. In the same approach, but with opposite results, Liu et al. (2021) conclude in favor of an insignificant influence of CSR on the ROA, ROE, and nominal interest margin profit. We

Table 8 Dynamic panel data estimation, two-step system GMM for the overall sample-dependent CSR

Variables	Coef	Coef	Coef	Coef	Coef	Coef
CSR(-1)	0.717***	0.778***	0.863***	0.822***	0.851***	0.856***
AUD	0.016	0.115	0.172	0.209*	0.147	0.139
AUD(-1)	−0.033	−0.122	−0.171	−0.193*	−0.127	−0.160*
ROE	0.001	0.001	0.001	0.0007	0.001	0.001
ROE(-1)	0.0001	0.0005	0.0002	0.0001	0.0002	0.0004*
PGR	0.0000	−0.001	−0.0006	0.000	−0.000	−0.001
PGR(-1)	−0.0002	−0.0003*	−6.42e-06	−0.0002	−0.0002	0.0001
ARR	0.0006	0.001	0.0012	0.002	0.001	0.001
ARR(-1)	−0.0004***	−0.0004**	−0.00002	−8.63e-06	−0.0002	−0.0001
ROS	0.0004	0.001	0.001	0.000	0.0001	0.001
ROS(-1)	−0.0002**	−0.0002	−0.0001	−0.0002	−0.0001	−0.0001
IND	0.036	0.062	0.040			
IND(-1)	−4.135	0.653*	−0.066			
DIM	−0.003	−0.008		0.034		
DIM(-1)	0.014	0.006		−0.018		
AGE	−1.334***	−1.403***			−0.516	
AGE(-1)	1.206***	1.265***			0.486	
FA						−0.064
FA(-1)	−4.096	0.718**				0.049
Year/year dummies	0.012**	Included	Included	Included	Included	Included
Const	−19.535		0.129**	−0.035	0.249**	
Observ	630	630	630	630	630	630
Wald chi^2	29,554.92	22,568.35	75,587.19	36,899.34	128,079.68	17,207.02
Prob > chi^2	0.000	0.000	0.000	0.000	0.000	0.000

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. See Table 1 for the description of the acronyms

have found an insignificant effect of financial performance measured by both ROE and ROS over CSR. Okafor et al. (2021) as well explore the impact of CSR on financial performance for a sample of tech firms. They conclude two very important things, namely, (i) that companies that spend more on CSR experience a corresponding increase in revenue and profitability (ii) and that corporate governance moderates the impact of CSR spending on firm performance. Thus, we should also take into account in future studies corporate governance variables (following also Disli et al. (2022)), corporate reputation (as in Le (2022) and Fourati and Dammak (2021)), and national variables as cultural issues (like in Peng and Zhang (2022)) and financial market functioning.

Table 9 allows us to not only know the expected and verified results but also the significance level of the variables of our model, considering the panel Probit regression results presented in Tables 5, 6, and 7, in an attempt to compare our results to those of previous authors, as we did previously for the dynamic panel estimations.

After observing the expected sign and the verified sign, we can conclude that 55% of the variables show the intended sign. They are the audit, profit growth rate, debt ratio, size, and age variables, which showed a positive sign as we predicted. We predicted that the return of equity (ROE), asset rotation ratio, return of sales (ROS), and financial autonomy variables, which make up the remaining 45%, would also have a positive sign, but we verified the opposite. Regarding the statistical significance, all variables that showed the expected sign had a significance level of 1%. Despite having negative signs, the asset rotation ratio and financial autonomy variables showed a significant level of 10%. Taking everything into account, 66% of the variables are significant to the model, while the remaining 33% are not significant nor had the expected sign. We would like to stress that financial autonomy is negative in panel Probit models but reveals to be positive when the past values are used under the dynamic system GMM panel estimations like in Gadedjisso-Tossou et al. (2021). The different results among models also suggest that dynamic estimations are more valuable in the company context, although we are limited to the nature of the dependent variable while exploring the effects of financial performance over CSR.

Conclusions

With this study, we aimed at uncovering the decisive factors of CSR in the Portuguese business sector, considering that most of the previous studies concentrate on CSR impacts

Table 9 Expected sign, verified sign, and significance level of the panel *Probit* results

Variable	Expected sign		Verified sign	Significance level
AUD	(+)	De Lira Avelino et al. (2017)	(+)	0.01 (1%)
ROE	(+)	Murcia and dos Santos (2009); Liu et al. (2021)	(−)	without significance
		De Lira Avelino et al. (2017)		
PGR	(+)	Lopes and Alencar (2010)	(+)	without significance
		De Lira Avelino et al. (2017)		
ARR	(+)	Gueyie et al. (2021)	(−)	0.1 (10%)
ROS	(+)	Barauskaite and Streimikiene (2021)	(−)	without significance
IND	(+)	Jensen and Meckling (1976)	(+)	0.01 (1%)
		Murcia and dos Santos (2009)		
		De Lira Avelino et al. (2017)		
DIM	(+)	Stanwick and Stanwick (1998)	(+)	0.01 (1%)
		McWilliams and Siegel (2001)		
		Oliveira (2005)		
		Santos et al. (2007)		
		De Lira Avelino et al. (2017)		
AGE	(+)	Santos et al. (2007)	(+)	0.01 (1%)
FA	(+)	Okafor et al. (2021); Liu et al. (2021); Le (2022); Gueyie et al. (2021)	(−)	0.01 (1%)

See Table 1 for the description of the acronyms

on financial performance. With this in mind, we analyzed the period between 2008 and 2018, resulting in a study of 11 years. We collected data from 63 companies founded and based in Portugal, of which 42 are listed in Euronext Lisbon and the remaining 21 are not listed. The chosen subsamples, listed companies, and non-listed companies were compared (and we were unable to find a previous study using non-listed firms due to data nonavailability) although we understood that being listed might determine the implementation of CSR, perhaps to maintain the reputation in the market and the impact of such practices in the stakeholders' reaction.

We analyzed that the definition of our dependent variable is quite ambiguous, making it difficult to clarify. This difficulty is also shared by Dahlsrud (2008), as well as the other authors (for example, Barauskaite and Streimikiene 2021 and Velte 2021). We agree with McWilliams and Siegel (2001), who understand CSR as the daily actions which drive us towards social welfare, without merely considering the company interests, which are, generally, required by law.

The estimated models did not behave as we predicted initially. Our results may have been influenced due to the used variables corresponding only to the ones disclosed publicly by the companies, possibly creating a bias. Moreover, the number of companies included in the final sample also had an influence, exactly for the same limitation we pointed out when accessing the data. Only 55% of the variables showed the expected sign. The ones that showed a positive sign were the audit, profit growth, debt ratio, size, and age variables. Financial performance was only significant under the dynamic GMM model. Contrary to what we predicted, the return of equity (ROE), asset rotation ratio, return of sales (ROS), and financial autonomy variables, which make up the remaining 45%, had the opposite sign in the panel Probit estimations.

Generally, the audit variable had the best behavior in the estimations (significant at 1% in all of them). This means that the company audited by one of the Big Four firms will consider and implement CSR practices. The companies audited by entities with a great reputation are more controlled, with its reputation undoubtedly subject to great control. Since investors do not have the best reaction to deviations, these companies will face greater restrictions regarding possible deviations to the announced CSR practices. Let us not forget that, according to Oliveira (2005), these practices are shown through social balances, annual reports, and sustainability reports. Therefore, it is understood that the company audited by an entity as prestigious as the ones from the Big Four aims at being socially responsible. One of them is KPMG, which explains the main benefit in including CSR practices is about the companies' ability to improve their image in the eyes of society in which they are based, as well as their reputation and financial performance (KPGM, 2008). Hence, it was expectable that the audit variable turned out to be determinant, with a positive impact.

It is important to highlight that we join Sen and Bhattacharya (2003) when it comes to the identification of a client with the respective ideology that will always be a benefit to the company. Therefore, we expect the companies to adopt a more socially responsible behavior in their daily work. We

believe being socially responsible is, nowadays, an absolute key practice, not only for the capital gains that might represent for the company but also for the positive impact regarding the improvement of quality of life and environmental sustainability. Despite the data presented not supporting our understanding, we believe it will be, due to the multicollinearity and heteroskedasticity detected in the study, which are a phenomenon we intend to fix through dynamic panel estimations. Finally, the different samples revealed different results highlighting the need to explore deeper the effects of financial performance over CSR practices, not only in Portugal but abroad.

For future research, we advise not to consider biased data. For this purpose, it is expected to only analyze CSR data and that this is extracted objectively. Moreover, a larger number of companies might provide more clear conclusions. Thus, we recommend a more varied and comprehensive sample. Furthermore, the SME universe can be specifically considered to understand if being a small- and medium-size company is a decisive factor of CSR practices (Le, 2022).

Appendix

Table 10 Listed companies on the Stock Exchange: *Euronext* Lisbon and non-listed companies

Listed companies on Euronext Lisbon	Non-listed companies
Altri, SGPS, S.A	ADP – Águas de Portugal, SGPS, S.A
CONDURIL – Engenharia, S.A	Altice Labs, S.A
Corticeira Amorim, SGPS, S.A	ANA – Aeroportos de Portugal, S.A
CTT – Correios de Portugal, S.A	APDL – Administração dos Portos do Douro, Leixões e Viana do Castelo, S.A
EDP – Energias de Portugal, S.A	
EDP Renováveis Portugal, S.A	
Estoril-Sol, SGPS, S.A	Copidata, S.A
Futebol Clube do Porto – Futebol, SAD	CP – Comboios de Portugal, E.P.E
Galp Energia, SGPS, S.A	EFACEC – Engenharia e Sistemas, S.A
Glintt – Global Intelligent Technologies, S.A	Infraestruturas de Portugal, S.A
Grupo Media Capital – SGPS, S.A	Metropolitano de Lisboa, E.P.E
Ibersol – SGPS, S.A	Novadelta – Comércio e Indústria de Cafés, LDA
Inapa – Investimentos, Participações e Gestão, S.A	
IMobiliária Construtora Grão-Para, S.A	Porto Editora, S.A
IMPRESA – Sociedade Gestora de Participações Sociais, S.A	Rádio e Televisão de Portugal, S.A
Inapa – Investimentos, Participações e Gestão, S.A	Revigrés – Indústria de Revestimentos de Grés, LDA
ISA – Intelligent Sensing Anywhere, S.A	
Jerónimo Martins – SGPS, S.A	SATA Air Açores – Sociedade Açoriana de Transportes Aéreos, S.A
Lisgráfica – Impressão e Artes Gráficas, S.A	
Luz Saúde, S.A	SDC – Investimentos, S.A
Martifer – SGPS, S.A	Servilusa – Agências Funerárias, S.A
Mota-Engil, SGPS, S.A	SIC – Sociedade Independente de Comunicação, S.A
NOS, SGPS, S.A	
Novabase – Sociedade Gestora de Participações Sociais, S.A	Sociedade Transportes Colectivos do Porto, S.A
OLI – Sistemas Sanitários, S.A	
Patris Investimentos, SGPS, S.A	Sogrape Vinhos, S.A
PHAROL – SGPS, S.A	Super Bock Group, SGPS, S.A
Ramada – Investimentos e Indústria, S.A	Transportes Aéreos Portugueses, S.A
Reditus – Sociedade Gestora de Participações Sociais, S.A	
REN – Redes Energéticas Nacionais, SGPS, S.A	
Semapa – Sociedade de Investimento e Gestão, SGPS, S.A	
Sonae – SGPS, S.A	
Sonae Capital – SGPS, S.A	
Sonae indústria – SGPS, S.A	
Sonaecom – SGPS, S.A	
SONAGI, SGPS, S.A	
Sport Lisboa e Benfica – Futebol, SAD	
Sporting Clube de Portugal – Futebol, SAD	
Sumol + Compal, S.A	
Teixeira Duarte, S.A	
The Navigator Company, S.A	
Toyota Caetano Portugal, S.A	
VAA – Vista Alegre Atlantis, SGPS, S.A	
Total: 42 companies	Total: 21 companies

Source: Author's elaboration

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