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EXPLORING THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY POLICIES ON FIRM VALUE: THE CASE OF LISTED COMPANIES IN ROMANIA

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ABSTRACT. Corporate social responsibility (CSR) highlights the reaction to social pressures, respectively the reply to the needs and expectations of stakeholders, concerns towards the environment, and social needs that depict its dimensions. Our paper aims at providing evidence on the links between CSR and firm value on the example of listed companies in Romania. The importance of this research emerges by the goal of strengthening a high level of consumer's trust in business and the noteworthy impact of companies to societal well-being. Based on a multidimensional CSR policies questionnaire, we developed a global index of CSR, as well as four subindices on social involvement, employees, products and services, environmental protection, both equal-weighted (EW) and stakeholder-weighted (SW). Firm value was proxied by Tobin's Q ratio adjusted according to activity sector. Based on the EW approach, we found a positive impact of the CSR global index and CSR subindices, with the exception of the CSR subindex related to environmental protection, on firm value. The SW approach reinforces only the positive impact of the CSR global index and CSR subindex on the quality, safety, and effectiveness related to products and services, on firm value. Besides, several CSR aggregate measures are significantly different for listed companies on the first tier and listed companies on the second tier.

JEL Classification: G32, M14

Keywords: Corporate social responsibility, firm value, multivariate regression models, T-test, Romania.

Introduction

Each and every business evolves based on community's orientations, similar to the government being a social contract as an implicit suite of rights and obligations. However, the specifics of the contract could be changed according to the transformations within community, but generally, the contract remains the source of the business legitimacy (Donaldson, 1982). In fact, this social contract reveals the mean on which the business conduit is congruent with the aims of community. Likewise, according to Rawls (1971) and

Ozar (1979), by considering the view of corporate social responsibility (hereafter CSR), the affairs are acting as a moral agent within community, the corporations reflecting and strengthening the values. Thus, the social contract, as well the moral agency, reproduces the fundamental prerequisites as regards the notion of CSR. In the sense of the Commission of the European Communities (COM, 2001, p. 366), 'corporate social responsibility is essentially a concept whereby companies decide voluntarily to contribute to a better society and a cleaner environment'. According to Crisóstomo *et al.* (2011), CSR is related to an extensive spectrum of connections between company and various stakeholders, as well the environment. Additionally, social responsibility is considered an answer to social pressures, respectively a reply to the needs and expectations of stakeholders, concerns towards the environment, and social needs that characterize its dimensions. Moreover, corporate social performance of a certain company could be defined as 'a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships' (Wood, 1991). Furthermore, according to World Commission on Environment and Development (WCED, 1987), sustainable development is viewed as 'development that meets the needs of the present, without compromising the ability of future generations to meet their own needs'. As such, Elkington (1999) considered that sustainable development of business requests the measurement against the triple bottom line of people (society), planet (ecology), as well as profit/prosperity (economy). Consequently, Gimenez *et al.* (2012) noted that sustainability incorporates several responsibilities such as social, environmental, and economic. Besides, Sriram *et al.* (2013) noticed that 'lack of social/ecological sustainability in organizations entails the risk of modern business firms becoming the dinosaurs of tomorrow'.

Our paper aims to provide empirical evidence on the link between corporate social responsibility (CSR) and firm value for a sample of listed companies on the Bucharest Stock Exchange (hereafter BSE). There was developed a global index of CSR, as well as four subindices, based on a multidimensional CSR policies questionnaire, for the following social categories: social involvement; the rights, health, safety, security, and development of the employees; ensuring the quality, safety, and effectiveness of the products and services; environmental protection. Thus, the aggregate measures of CSR will be compared depending on tier of listing. In the light of the renewed EU strategy 2011-2014 for corporate social responsibility (COM, 2011, p. 681), the importance of this research is emphasized by the aim of reinforcing a high level of consumer's trust in business, respectively a significant contribution of corporations to societal well-being.

1. Corporate social responsibility as driver of firm value

Schuler & Cording (2006) emphasized several theoretical models, which suggest a direct link between corporate social performance (hereafter CSP) and corporate financial performance (hereafter CFP): good management theory, stakeholder contract costs theory, private costs theory, managerial guile theory, and affordability theory. There is argued that good management theory, alongside stakeholder contract costs theory assumes a positive relationship between CSP and CFP, whereas private costs theory shows a negative connection. Therewith, the following requisites should be fulfilled: the availability of information as regards the firm's CSP, stakeholder's awareness with respect to that information, stakeholder's values underline other-regarding characteristics, the stakeholders are motivated to follow a supportive behavior towards the company. Moratis & Cochius (2011) revealed internal desire, external pressure, as well as financial added value as the most frequent motives for selecting to improve corporate sustainability.

Good management theory supports the fact that the managerial skills and strategies used to engender a substantial CSP are essential onward in order to record a significant CFP (Alexander & Buchholz, 1978; Anderson & Frankle, 1980; Davis, 1973; Frooman, 1997; Ullmann, 1985; Waddock & Graves, 1997b). Given the fact that good management theory relates the managerial undertakings with social involvement, the stakeholders will infer the social stance of the companies by examining its market behavior. Besides, a good management will lead to important investments related to social responsibility undertakings, thus the relationship with key stakeholder groups being improved (Freeman, 1984), therewith being considered precondition for a remarkable global corporate financial performance. The steps towards CSR will strengthen the profitability, since the related financial benefits will overcome the related costs due to the adopted management. As well, the stakeholder contract costs theory assumes that the benefits of CSP will exceed the related costs (Jones, 1995), whilst stakeholders are exerting social control over the companies (Wood, 1991). Moreover, there is emphasized an extension of the resources assigned for social undertakings (Berman *et al.*, 1999; Frooman, 1997; Preston & O'Bannon, 1997; Waddock & Graves, 1997b), being presumed the fact that these are acknowledged by stakeholders. Thereby, the undertaken social responsibility actions will decrease the relational costs with stakeholders, which expect a fair attitude of the companies as regards their own rights and profit distribution (Sen, 1997; Swanson, 1995). Thereupon, when a company will respect this implicit contract, the social harmony will be fostered and the costs on maintaining the relationships with stakeholders will be reduced (Jones, 1995). On the contrary, if the implicit contract is not followed, there will occur an increase of the costs related to ongoing business. Husted & Salazar (2006) underlined three types of CSR based on the motivation of the firm, as follows: altruism, coerced egoism, and strategy. However, there was argued that the companies are acting socially responsible only when the existing legal requirements enforce such proceedings. Nevertheless, the strategic approach will engender to a greater overall social output, than by the altruistic approach.

According to private costs theory, CSP will cause several costs that will be carried by the company, but without assessing the output. Therewith, the private costs theory disposes by a normative component, respectively the imperfect nature related to CSR undertakings, which entails a negative private return (Aupperly *et al.*, 1985; Friedman, 1970; Preston & O'Bannon, 1997). As Friedman (1970) noticed, there are managers that undertake CSR actions, but do not consider the related opportunity costs, thus discarding activities, which could be profitable for themselves or for the company. The managerial guile theory emanates out of the agency theory (Jensen & Meckling, 1976) and underlines that managers could initiate socially responsible actions towards social welfare, detrimental to the global CFP (Preston & O'Bannon, 1997), by considering the hardship of the owners as regards the managers' behavior within large corporations (Berle & Means, 1932). The affordability theory marks that only those companies, which record a suitable corporate performance, could undertake socially responsible actions given the related costs. The affordability theory is harmonious with the CSR model developed by Carroll (1979) according to which the managers will accomplish firstly the economic responsibilities, then those legal and ethical, and finally discretionary responsibilities. Furthermore, slack resource theory, originally described by Cyert & March (1963), mentions that the companies are not acting efficient. Slack resources are convenient means through which could be tackled unexpected events or could be carried programmatic changes. McGuire *et al.* (1988) and McGuire *et al.* (1990) showed a better CFP if slack resources are assigned to the social domain.

Likewise, we distinguish two different views as regards socially responsible actions, respectively stakeholder value maximization view and shareholder expense view. Accordingly, stakeholder value maximization view is supported by contract theory and firm

theory (Coase, 1937; Alchian & Demsetz, 1972; Jensen & Meckling, 1976; Cornell & Shapiro, 1987; Hill & Jones, 1992). The firm is seen as a set of contracts between shareholders and another stakeholder, every group of stakeholders providing resources to the company and holding rights which come from explicit contracts (wage-employment contract or product warranty) or from implicit contracts (employees' security or uninterrupted services to customers). The value of implicit contracts is influenced by the expectations of stakeholders on following the commitments by the company (Cornell & Shapiro, 1987). The companies, which are investing significant amounts in CSR, tend to register a strong reputation due to maintaining the assumed engagements within implicit contracts, therefore, the stakeholders of such companies having incentives in order to provide resources and to agree less favorable explicit contracts than the stakeholders of the companies with lower CSR investments do. By taking into account the expenditures carried by the shareholders, the managers are initiating socially responsible actions in order to support another stakeholder, but the expenses being endured by the shareholders (Vance, 1975; Friedman, 1970; Pagano & Volpin, 2005; Surroca & Tribó, 2008; Cronqvist *et al.*, 2009), thus resulting a transfer of wealth from shareholders towards another stakeholder.

The positive link between CSR and CFP is supported by the instrumental stakeholder theory (Jones, 1995), being argued that those companies doing well financially are using in a more efficient way their resources in order to satisfy the manifold needs of stakeholders (Waddock & Graves, 1997a). The aforementioned theory is instrumental inasmuch as suggests the use of CSR for a better performance (Jones, 1995; McGuire *et al.*, 1988). Withal, the stakeholder theory supports that the managers should establish strategic decisions and assign resources in a conformable manner with the requests from stakeholder groups.

2. Related literature and research hypothesis development

2.1. Related literature towards the impact of environmental responsibility on firm value

Sustainable development pursues an uninterrupted improvement as regards the quality of life, alongside the well-being of current and future generations, being a key objective within the European Union (hereafter EU). The Europe 2020 strategy has set the following aims towards climate change and long term energy saving: a reduction of 20% or 30% in favorable conditions in the EU greenhouse gas emissions from 1990 levels, raising the share of the EU energy consumption produced from renewable resources to 20%, and a 20% improvement in the energy efficiency of the EU. Furthermore, there was set a 10% binding minimum target to be achieved by every EU member state towards the share of biofuels within overall EU transport petrol and diesel consumption by 2020.

We emphasize the action plan on sustainable consumption and production and sustainable industrial policy (COM, 2008, p. 397 final), the fundamental factor being the dynamic framework in conjunction with the improvement of energy and environmental performance of products, respectively the encouragement of consumers for their adoption. The previously mentioned action plan comprises the creation of a new sustainable product policy in order to improve the environmental performance of products within the market and the support given to the consumers as regards purchasing of environmental products and promoting eco-innovation. Therefore, the business driven in the EU could adapt to future markets, together with supporting competition within eco-industries and the contribution to the substantiation of an international economy based on low carbon consumption. Thus, there is followed an improvement of the general environmental performance of the products during its life-cycle, promoting and stimulating the demand for products, and better manufacturing

technologies, as well the support of consumers as regards the establishment of purchasing decisions through a coherent and simplified labeling.

Likewise, there were launched several policies which aims at improving the energy and environmental performance of products. The Ecodesign Directive (Directive 2005/32/EC) established a framework for setting ecodesign requirements for energy-using products. The purposes as regards the greenhouse gas emissions could be accomplished through improving the energy return that could be achieved through more efficient final electricity consumption. The consumers are notified on the energy and environmental performance of products through the labelling schemes entered by the Energy Labelling Directive (Council Directive 92/75/EEC), the Energy Star Regulation (Regulation (EC) No 106/2008), and the Ecolabel Regulation (Regulation (EC) No 1980/2000).

According to Shrivastava (1995a), the natural environment is an important framework towards economic competition, environmental issues related to energy, natural resources, pollution, or waste, thus providing competing opportunities and constraints, the corporations having the chance to acquire a competitive advantage by managing the environmental variables. Thus, the corporate environmental strategy is an instrument, which supports the companies in gathering a competitive advantage and recording a better performance (Porter & Van der Linde, 1995; Shrivastava, 1995a; Hart, 1997; Trung & Kumar, 2005). As regards pollution prevention, the companies could reduce the related costs and energy consumption, therewith existing the possibility of materials' reuse through recycling (Greeno & Robinson, 1992; Taylor, 1992; Shrivastava, 1995b; Hart, 1997). The eco-efficiency determines the manufacturing and providing of products through decreasing the environmental impact and resources' use (Knight, 1995; Starik & Marcus, 2000). However, the pollution emphasizes ineffective processes (Kleiner, 1991; Porter & Van der Linde, 1995), thus the companies should take into account the productivity of resources and the opportunity cost of pollution (wasted resources, the employed effort, a reduced value of products from the customers' point of view). In addition, the companies that highlight strong environmental initiatives will record a better environmental reputation (Shrivastava, 1995b; Miles & Covin, 2000).

The results of previous studies, which explored the link between environmental responsibility and firm value, are not converging. Dowell *et al.* (2000) identified a better value, respectively a higher Tobin's Q ratio for the companies that adopted a single, stringent global environmental standard. Bird *et al.* (2007) found a negative relationship between environmental concerns and future stock returns. Based on a meta-analysis employed for 37 empirical studies, over 2008-2009, Horváthová (2010) suggested a positive relationship between environmental and financial performance in half of the studies, whereas rest of the studies emphasized a negative link or a lack of any statistical significance. Guenster *et al.* (2011) established a positive and slightly asymmetric relationship between eco-efficiency scores and operating performance and market value. The firm's eco-efficiency was defined 'as the ability to create more value while using fewer environmental resources, such as water, air, oil, coal and other limited natural endowments'. Lioui & Sharma (2012) concluded a negative link between KLD environmental ratings and Tobin's Q ratio. Marsat & Williams (2013) documented a negative relationship between MSCI ESG rating and market value.

2.2. Related literature towards the link between corporate social responsibility indices and firm value

Grounded on a variety of sources such as company's reports, government data, non-governmental organizations' data, media, the index Kinder Lydenberg Domini (hereafter KLD) is a prevalent estimator of CSP, which evaluates the following major domains: community, corporate governance, diversity, the relations with the employees, environment,

human rights, product safety and quality. In fact, we emphasize the lack of a weighting scheme corresponding to the aforementioned dimensions of CSP (Graves & Waddock, 1994). However, even if there is frequently employed a common approach which sums all KLD stakeholder scores, this strategy assumes that all dimensions are treated as equally important (Griffin & Mahon, 1997), but based on Wood & Jones (1995), there is required a distinct attitude towards different stakeholders according to the various interests. Thus, Akpinar *et al.* (2008) proposed a stakeholder weighted CSR index and found a positive relationship between stakeholder weighted CSR index and CFP, whereas this link was not significant when equal-weighted CSR index was employed. In addition, we highlight a set of CSR indices and institutions: Korean Economic Justice Institute Index (KEJI) developed by Citizens' Coalition for Economic Justice (CCEJ), Council on Economic Priorities (CEP) in the US, Corporate Responsibility Index in Australia, or Asahi Foundation in Japan.

Similar Akpinar *et al.* (2008), Choi *et al.* (2010) found a positive relationship between stakeholder weighted CSR index and CFP measured by ROE, ROA, and Tobin's Q ratio. By using the CSR scores provided by Credit Lyonnais Securities (Asia), over 2001-2004, Cheung *et al.* (2010) showed a positive relationship between CSR and market valuation. Jo & Harjoto (2011) established that CSR engagement positively influences firm value proxied by industry-adjusted Tobin's Q ratio, based on KLD index. By using a time series fixed effects approach, Nelling & Webb (2009) demonstrated a weaker relation between CSR and CFP. Contrariwise, based on a database comprising 599 companies from 28 countries, provided by Sustainalytics Responsible Investment Services, Surroca *et al.* (2010) concluded that there is no direct relationship between CSR and CFP. Likewise, Crisóstomo *et al.* (2011) pointed out a significant negative correlation between CSR index developed based on the information provided by the Brazilian Institute of Social and Economic Analysis (IBase) on three corporate social action segments (relationship with employees, external social action, and environmental action) and Brazilian firms value.

Based on prior studies we set the following research hypothesis: *There is a statistically significant positive link between the CSR global index, CSR subindices, and firm value.*

3. Data and research methodology

3.1. Sample selection procedure and definition of variables

Our initial sample comprised 80 listed companies on the BSE in 2012, on all the three tiers (26 listed companies on the first tier, 52 listed companies on the second tier, respectively one listed company at the third tier), as well as one listed company on the 'International' tier.

First tier shares are the most liquid in the market, the requirements for listing including a free float held by at least 2,000 dissimilar shareholders, profitability in the past two years, a business plan for at least the next two years, as well as a total equity of a firm of at least EUR 30m. The second tier includes companies with a total equity of at least EUR 2m, whereas the third tier includes companies with a total equity of at least EUR 1m.

Subsequently, there were dropped from our sample the companies out of financial intermediation sector (11 companies) as follows: three credit institutions, five financial investment companies, one financial investments services company, Property Fund, and the Bucharest Stock Exchange. Likewise, we removed two unlisted companies in 2012 (one unlisted company from the first tier, as well as one unlisted company from the second tier), also being removed the listed company on the 'International' tier, alongside that listed on the third tier. Therefore, the final sample comprises 65 companies (15 listed companies on the first tier, 50 listed companies on the second tier). The membership to the activity sector is various, as follows: wholesale/retail (4), construction (8), pharmaceuticals (4), manufacturing

(19), plastics (3), machinery and equipment (7), metallurgy (3), food (3), chemicals (3), basic resources (4), transportation and storage (2), tourism (3), utilities (2).

Table 1 shows the definition and measurement of variables employed within empirical research. Firm value will be proxied by Tobin's Q ratio adjusted according to activity sector. We followed the definition set out by Kaplan & Zingales (1997), Gompers *et al.* (2003), and Bebchuk *et al.* (2009) in order to compute Tobin's Q ratio. Next, Tobin's Q ratio was adjusted according to activity sector due to the multifarious membership, similar to the methodology described by Eisenberg *et al.* (1998). Therefore, the difference between Tobin's Q ratio of a certain company and the median of the corresponding activity sector is ΔQ, whereas Tobin's Q ratio adjusted according to activity sector (QAdj) is defined as follows (Eq 1):

$$QAdj = sign(\Delta Q)*sqrt(|\Delta Q|) \quad (1)$$

where sign(ΔQ) is the sign of difference between Tobin's Q ratio of a certain firm and the median of the related activity sector, and sqrt(|ΔQ|) is the square root of the absolute value of ΔQ. There was used median instead of mean since our data did not follow a normal distribution. The source of financial data was the annual reports released by the selected firms.

Table 1. Justified definition and measurement of variables

Variables	Definition
Panel A: Variables regarding firm value	
QAdj	Tobin's Q ratio adjusted according to activity sector, computed as the market value of assets divided by the book value of assets, where the market value of assets equals the book value of assets plus the market value of common equity less the sum of the book value of common equity.
Panel B: Variables regarding corporate social responsibility	
CSRGI_EW	Equal-weighted CSR global index.
CSRGI_SW	Stakeholder-weighted CSR global index.
SOCIAL_EW	Equal-weighted CSR subindex on social involvement.
SOCIAL_SW	Stakeholder-weighted CSR subindex on social involvement.
RHSSDE_EW	Equal-weighted CSR subindex on the rights, health, safety, security, and development of the employees.
RHSSDE_SW	Stakeholder-weighted CSR subindex on the rights, health, safety, security, and development of the employees.
QSEPS_EW	Equal-weighted CSR subindex on ensuring the quality, safety, and effectiveness of the products and services.
QSEPS_SW	Stakeholder-weighted CSR subindex on ensuring the quality, safety, and effectiveness of the products and services.
ENV_EW	Equal-weighted CSR subindex on environmental protection.
ENV_SW	Stakeholder-weighted CSR subindex on environmental protection.
Panel C: Firm-level control variables	
Size	Firm size, as the annual total assets (logarithmic values).
D/E	Indebtedness ratio, computed by dividing the firm's total debt by its total shareholder's equity.
SG	Sales growth, as the relative increase of sales from the previous year (%).
Listing	The number of years since listing on the BSE (logarithmic values).
Tier	Dummy variable: If the company is listed on the first tier, then Tier = 1 If the company is listed on the second tier, then Tier = 0

Source: Author's own work.

Table 2 provides the composition of multidimensional CSR policies questionnaire, comprising 40 items and 4 dimensions as following: social involvement (hereafter SOCIAL); the rights, health, safety, security, and development of the employees (hereafter RHSSDE); ensuring the quality, safety, and effectiveness of the products and services (hereafter QSEPS); environmental protection (hereafter ENV). After exploring the official websites and the annual reports of the companies, every item for each of the four considered dimension was binary valued, being encoded with '0' in case of failure in implementation and '1' in case of fulfillment.

Table 2. Questionnaire on corporate social responsibility policies

1. Policies on social involvement (16 items)	
SOCIAL 1.	Helping communities affected by natural disasters.
SOCIAL 2.	Supporting the following categories of persons: children with special needs, severely disabled or suffering of various serious illnesses, children out of hospitals, broken families showing the risk of abandoning their children, elderly patients or elderly abandoned by their families.
SOCIAL 3.	Supporting the education of children in rural areas.
SOCIAL 4.	Financial support for talented young students.
SOCIAL 5.	Financial support for older actors or younger actors with lower income or without any revenues.
SOCIAL 6.	Socially responsible involvement in voluntary blood donation campaigns.
SOCIAL 7.	Socially responsible investments in urban infrastructure.
SOCIAL 8.	Socially responsible investments in rural infrastructure.
SOCIAL 9.	Socially responsible investments in schools.
SOCIAL 10.	Socially responsible investments in healthcare.
SOCIAL 11.	Socially responsible investments in cultural centers or religious units.
SOCIAL 12.	Socially responsible involvement in community health issues.
SOCIAL 13.	Socially responsible involvement in sports activities.
SOCIAL 14.	Socially responsible involvement in cultural activities.
SOCIAL 15.	The company leads partnerships with foundations.
SOCIAL 16.	The availability of a Code of Conduct and Ethics for Employees and Directors.
2. Policies on the rights, health, safety, security, and development of the employees (5 items)	
RHSSDE 1.	The availability of a policy against employment discrimination or discrimination at
RHSSDE 2.	The company enforces programs towards promoting workplace diversity.
RHSSDE 3.	The availability of a collective bargaining agreement.
RHSSDE 4.	Employees protection at the workplace through implementing a management system towards occupational health and safety according to OHSAS 18001:2008.
RHSSDE 5.	The company enforces professional development programs of employees.
3. Policies on ensuring the quality, safety, and effectiveness of the products and services (5 items)	
QSEPS 1.	The availability of a quality management system according to ISO 9001:2008.
QSEPS 2.	The company discloses comprehensive information on provided products, services, or activities.
QSEPS 3.	The company owns a portfolio of ecolabel products and services.
QSEPS 4.	The company uses renewable raw materials in the product manufacturing process.
QSEPS 5.	The products provided by the company could be recycled or reused after scraping
4. Policies on environmental protection (14 items)	
ENV 1.	The availability of an environmental management system according to ISO 14001:2004.
ENV 2.	The availability of an energy management system according to EN 16001:2009 or ISO 50001:2011.

ENV 3.	The company is concerned towards energy saving or a more efficient final electricity consumption.
ENV 4.	The company uses renewable energy.
ENV 5.	The company owns greenhouse gas emission certificates or green certificates.
ENV 6.	Concerns or socially responsible investments towards water protection.
ENV 7.	Concerns on reducing water consumption or a more efficient usage of water.
ENV 8.	Concerns or socially responsible investments towards natural resources protection and biodiversity conservation.
ENV 9.	Concerns or socially responsible investments towards air protection.
ENV 10.	Concerns or socially responsible investments as regards land and groundwater protection.
ENV 11.	Concerns or socially responsible investments as regards protection against noise and vibration.
ENV 12.	The company owns a selective waste collection system.
ENV 13.	The company owns a waste recycling system.
ENV 14.	Socially responsible involvement in tree planting campaigns.

Source: Author's own work.

Besides, for each selected company we developed four CSR subindices and the CSR global index, by considering both an equal-weighted (hereafter EW) and stakeholder-weighted (hereafter SW) approach, similar Akpinar *et al.* (2008) and Choi *et al.* (2010). We computed each EW-CSR subindex for every firm (marked with subscript *i*) by summing up the binary values of every established item out of corresponding dimension, as follows (Eq 2 - Eq 5):

$$SOCIAL\_EW_i = \sum_{SOCIAL=1}^{16} x_{iSOCIAL} \quad (2)$$

$$RHSSDE\_EW_i = \sum_{RHSSDE=1}^{5} x_{iRHSSDE} \quad (3)$$

$$QSEPS\_EW_i = \sum_{QSEPS=1}^{5} x_{iQSEPS} \quad (4)$$

$$ENV\_EW_i = \sum_{ENV=1}^{14} x_{iENV} \quad (5)$$

The EW-CSR global index for every firm ensued by summing up the values related to the four EW-CSR subindices, as follows (Eq 6):

$$CSRGI\_EW_i = SOCIAL\_EW_i + RHSSDE\_EW_i + QSEPS\_EW_i + ENV\_EW_i \quad (6)$$

Furthermore, in case of SW approach, subsequently classifying the firms (marked with subscript *i*) into the 13 activity sectors (marked with subscript *j*), binary EW-CSR subindices for each of the four dimensions (marked with subscript *k*) were summed up to acquire an overall score of CSR performance for that specific activity sector (Eq 7). Afterwards, individual sums for each of the four dimensions were divided by this overall sum to catch the weights for each of the four dimensions for every activity sector (Eq 8). After taking the weights for every activity sector, we have multiplied the raw binary EW-CSR subindices values with related weights to gather new SW-CSR subindices for each firm (Eq 9).

$$Overall\_score_{jk} = \sum_i EW - CSR\_subindex_{ijk} \quad (7)$$

$$Weight_{jk} = \frac{Overall\_score_{jk}}{\sum_{k=1}^{4} Overall\_score_{jk}} \quad (8)$$

$$SW\text{-}CSR\_subindex_i = \sum_{k=1}^{4} EW - CSR\_subindex_{ijk} * Weight_{jk} \quad (9)$$

By summing up the values of SW-CSR subindices there resulted the SW-CSR global index, as follows (Eq 10):

$$CSRGI\_SW_i = SOCIAL\_SW_i + RHSSDE\_SW_i + QSEPS\_SW_i + ENV\_SW_i \quad (10)$$

Moreover, we will include several firm-level control variables that could influence firm value. The size of the companies is assessed through the annual total assets (logarithmic values), similar Arlow & Gannon (1982), Ullmann (1985), Griffin & Mahon (1997), Waddock & Graves (1997b), Husted & Allen (2007). The companies' size influences their ability to initiate CSR undertakings, since small companies show a reduced potential as regards supporting CSR actions, relative to large companies, which have a well-grounded infrastructure and substantial cash flows. However, as the company is growing, the reputation and the responsibility towards stakeholders' needs is increasing. According to Roberts (1992), stakeholders' well-being is influenced by the presence of financial troubles. We control for the indebtedness level through debt-to-equity ratio since a strong stakeholder oriented company is considered suitable managed, being consequently less risky. The growth opportunities are proxied by the relative increase of sales from the previous year inasmuch as these could improve the satisfaction of the employees and customers by increasing the sales. Therewith, we control for the tenure of the company as proxied by the number of years since listing on the BSE (logarithmic values).

3.2. Empirical research methods

In order to catch the influence of the global index of CSR, as well as four subindices, on the BSE listed companies firm value, there will be employed several multivariate regression models, by considering the following general specification (Eq 11):

$$Firm\_value_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + u_i \quad i = 1, \ldots, 65 \quad (11)$$

where for the *i*th company we set as dependent variable firm value as proxied by Tobin's Q ratio, adjusted according to activity sector, respectively independent variables, X_i being the global index of CSR or the designed subindices, both EW and SW, Z_i being the vector of firm-level control variables. Further, as robustness checks, we will compute the centered variance inflation factors (hereafter VIFs) to examine for multicollinearity towards every estimated econometric model. Based on Gujarati (2003), if multicollinearity occurs, then: 'the OLS estimators have large variances and covariances, making precise estimation difficult; the confidence intervals tend to be much wider; the t ratio of one or more coefficients tends to be statistically insignificant; the overall measure of goodness of fit, can be very high; the OLS estimators and their standard errors can be sensitive to small changes in the data'.

Furthermore, in order to assess whether the means of CSR aggregate measures for the listed companies on the first and the second tier are statistically different from each other, we will employ the T-Test. The formula for the T-Test is showed below:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad (12)$$

where $\bar{X}_1$ is the mean of CSR aggregate measures of listed companies on the first tier, $\bar{X}_2$ is the mean of CSR aggregate measures of listed companies on the second tier, S_1 is the standard deviation of listed companies on the first tier, S_2 is the standard deviation of listed companies on the second tier, n_1 is the total number of listed companies on the first tier, and n_2 is the total number of listed companies on the second tier. The null hypothesis, which is assumed to be true until proven wrong, is that there is no difference between CSR agreggate measures of listed companies on the first and the second tier.

4. Results and discussion

4.1. Descriptive statistics and correlation analysis

Table 3 reveals descriptive statistics for the employed variables. Thus, the mean value of EW-CSR global index emphasizes that only 13 items out of 40 are applied, whilst the maximum score of 40 was not acquired by any of the selected firms. By examining the social involvement, on average, only three items out of 16 are fulfilled and the maximum score of 16 was not get by any of the selected companies. By considering the socially responsible actions towards the employees, on average, only two items out of five are accomplished, being two companies that registered the maximum score of five. The concerns of the BSE listed enterprises as regards ensuring the quality, safety, and effectiveness of the products and services, reveals, on average, that only two items out of five are achieved, being eight companies which recorded the maximum score of five. The average value related to EW-CSR subindex on environmental protection shows that only five items out of 14 are contented, though the maximum score of 14 was not recorded by any of the selected company.

Table 3. Descriptive statistics

Variables	N	Mean	Median	Min	Max	Q1	Q3	SD
Panel A: Variables regarding firm value								
QAdj	65	3.8831	0.0000	-19.8631	33.5136	-0.5848	13.0009	11.8005
Panel B: Variables regarding corporate social responsibility								
CSRGI_EW	65	13.1846	12.0000	3.0000	33.0000	8.0000	16.0000	6.9729
CSRGI_SW	65	4.4542	3.7419	0.7222	19.2564	2.4335	5.0968	3.2001
SOCIAL_EW	65	3.4154	2.0000	0.0000	13.0000	1.0000	5.0000	3.3814
SOCIAL_SW	65	1.0535	0.3399	0.0000	4.9057	0.1133	1.6129	1.3137
RHSSDE_EW	65	2.1385	2.0000	0.0000	5.0000	1.0000	3.0000	1.2103
RHSSDE_SW	65	0.3518	0.3350	0.0000	0.7547	0.1675	0.5025	0.1990
QSEPS_EW	65	2.3385	2.0000	0.0000	5.0000	1.0000	3.0000	1.3143
QSEPS_SW	65	0.4491	0.3611	0.0000	1.4151	0.2315	0.5106	0.3252
ENV_EW	65	5.2923	5.0000	0.0000	12.0000	3.0000	7.0000	2.7141
ENV_SW	65	2.5999	1.9507	0.0000	17.3333	1.3889	2.9261	2.7066
Panel C: Firm-level control variables								
Size	65	15.5266	16.3876	10.2433	22.7202	12.1316	18.7785	3.4051
D/E	65	0.5777	0.4313	-23.5300	16.9124	0.1627	1.0468	3.9887
SG	65	-0.0102	-0.0114	-0.7328	1.1325	-0.1172	0.1009	0.2645
Listing	65	2.5039	2.7081	1.3863	2.8332	2.6391	2.7081	0.4116
Tier	65	0.2308	0.0000	0.0000	1.0000	0.0000	0.0000	0.4246

Source: Authors' computations. Notes: The description of the variables is provided in *Table 1*.

The correlations coefficients are displayed in *Table 4*.

Table 4. Pearson's correlation matrix

Variables	1	2	3	4	5	6	7	8	9
1 QAdj	1								
2 CSRGI_EW	.029	1							
3 CSRGI_SW	-.037	**.675****	1						
4 SOCIAL_EW	.088	**.870****	**.584****	1					
5 SOCIAL_SW	.039	**.809****	**.531****	**.964****	1				
6 RHSSDE_EW	-.002	**.804****	**.468****	**.684****	**.617****	1			
7 RHSSDE_SW	-.010	**.720****	**.363****	**.589****	**.510****	**.974****	1		
8 QSEPS_EW	-.050	**.614****	.238	**.326****	**.273***	**.461****	**.439****	1	
9 QSEPS_SW	-.046	**.328****	.057	.030	-.050	**.260***	**.285***	**.890****	1
10 ENV_EW	-.011	**.829****	**.684****	**.526****	**.469****	**.544****	**.469****	**.480****	**.260***
11 ENV_SW	-.056	**.314***	**.891****	.176	.111	.151	.073	.009	-.049
12 Size	**-.589****	**.309***	**.337****	.168	.161	**.346****	**.324****	**.387****	**.367****
13 D/E	.006	-.072	-.015	-.002	.035	-.221	-.239	-.095	-.125
14 SG	.093	.129	-.037	.212	.225	.099	.089	.049	.027
15 Listing	.009	-.184	-.041	-.184	-.171	-.116	-.144	-.139	-.161
16 Tier	**.274***	**.402****	.181	**.465****	**.431****	**.332****	**.324****	-.002	-.169
Variables	10	11	12	13	14	15	16		
10 ENV_EW	1								
11 ENV_SW	**.515****	1							
12 Size	.242	**.252***	1						
13 D/E	-.038	-.002	-.182	1					
14 SG	-.001	-.163	.033	.244	1				
15 Listing	-.124	.064	.005	-.168	-.047	1			
16 Tier	**.307***	.002	**-.338****	-.062	.054	-.017	1		

Notes: **Significant at 1% level. *Significant at 5% level. The description of the variables is provided in *Table 1*.
Source: Authors' computations.

After exploring the Pearson's correlations (see *Table 4*) we notice high correlation coefficients between CSR subindices and CSR global index, but these variables will be employed in distinct multivariate regression models to avoid the multicollinearity phenomenon.

4.2. Multivariate regression results regarding the influence of corporate social responsibility on firm value

Table 5 shows the results of the estimations regarding the influence of equal-weighted CSR global index and subindices on firm value. By examining the influence of EW-CSR global index on firm value, the results provide support for a positive impact on Tobin's Q ratio adjusted according to activity sector (Eq 1), opposite Akpinar *et al.* (2008) and Choi *et al.* (2010).

Table 5. Empirical results regarding the influence of EW-CSR global index and subindices on firm value

Variables	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5
Intercept	**35.11468*** (3.570594)**	**36.26442*** (3.639346)**	**35.90135*** (3.615563)**	**34.75649*** (3.485304)**	**35.38892*** (3.505967)**
CSRGI_EW	**0.477327* (2.157908)**				
SOCIAL_EW		**0.762359† (1.686055)**			
RHSSDE_EW			**2.261604† (1.816473)**		
QSEPS_EW				**1.794566† (1.78931)**	
ENV_EW					0.644750 (1.262126)
Size	**-2.568055*** (-5.832947)**	**-2.357383*** (-5.651512)**	**-2.464759*** (-5.643941)**	**-2.374107*** (-5.706614)**	**-2.288832*** (-5.434044)**
D/E	-0.407011 (-1.28166)	-0.423889 (-1.314211)	-0.299857 (-0.920324)	-0.376693 (-1.171362)	-0.427036 (-1.308812)
SG	5.470581 (1.180824)	4.892199 (1.026845)	5.474642 (1.167059)	6.100689 (1.306139)	6.767744 (1.427565)
Listing	1.321222 (0.445658)	0.947565 (0.316075)	0.799606 (0.269731)	0.75553 (0.254901)	0.403261 (0.134836)
Tier	-2.899762 (-0.801172)	-1.997063 (-0.542995)	-1.553332 (-0.449081)	0.779257 (0.255885)	-0.322442 (-0.095096)
N	65	65	65	65	65
F-statistic	**7.209740***	**6.721200***	**6.844236***	**6.817855***	**6.384564***
R-sq	0.427208	0.410133	0.414528	0.413591	0.397762
Adj R-sq	0.367954	0.349112	0.353962	0.352928	0.335461

Notes: †p < 0.10. *p < 0.05. **p < 0.01. ***p < 0.001. The t-statistic for each coefficient is reported in parentheses. The description of the variables is provided in *Table 1*.
Source: Authors' computations.

In addition, the CSR subindex on social involvement (Eq 2), the CSR subindex on the rights, health, safety, security, and development of the employees (Eq 3), alongside the CSR subindex on the quality, safety, and effectiveness of the products and services (Eq 4), all EW, positively influences the firm value of the listed companies on the BSE. By considering the EW-CSR subindex on environmental protection, we note the lack of any influnce on QAdj (Eq 5). Based on the values of centered VIFs (see *Table 6*), we notice that the threshold of ten is not exceeded, thus the lack of multicollinearity. Likewise, based on the values of R-sq, we notice that the estimated models explain, on average, 41.63% of the variability of the response data around its mean.

Table 6. VIFs for the estimations towards the link between EW-CSR global index and subindices on firm value

Variables	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5
CSRGI_EW	1.729931				
SOCIAL_EW		1.650644			
RHSSDE_EW			1.615503		
QSEPS_EW				1.234158	
ENV_EW					1.329507
Size	1.634277	1.424513	1.573142	1.425387	1.422665
D/E	1.166723	1.168742	1.20154	1.168667	1.171400
SG	1.091833	1.121245	1.095158	1.084015	1.087387
Listing	1.082768	1.075144	1.059178	1.057169	1.048035
Tier	1.717406	1.722008	1.534509	1.187600	1.433535

Notes: The description of the variables is provided in *Table 1*.
Source: Authors' computations.

Furthermore, *Table 7* reports the results of the estimations regarding the influence of SW-CSR global index and subindices on firm value.

Table 7. Empirical results regarding the influence of SW-CSR global index and subindices on firm value

Variables	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5
Intercept	**38.44967***** **(3.843784)**	**36.65254***** **(3.621373)**	**35.11029***** **(3.49548)**	**33.81690**** **(3.370287)**	**38.04518***** **(3.740564)**
CSRGI_SW	**0.761718**† **(1.802998)**				
SOCIAL_SW		1.170458 (1.022476)			
RHSSDE_SW			11.31762 (1.499744)		
QSEPS_SW				**7.158470**† **(1.78253)**	
ENV_SW					0.589140 (1.242300)
Size	**-2.424985***** **(-5.675422)**	**-2.239254***** **(-5.342154)**	**-2.373368***** **(-5.493308)**	**-2.300110***** **(-5.726191)**	**-2.232927***** **(-5.492314)**
D/E	-0.471890 (-1.458294)	-0.427778 (-1.303465)	-0.299921 (-0.906824)	-0.336502 (-1.04057)	-0.452699 (-1.378407)
SG	7.319877 (1.558957)	5.447081 (1.125582)	5.650855 (1.194696)	6.042811 (1.293154)	7.641769 (1.578686)
Listing	0.063570 (0.021714)	0.467202 (0.154352)	0.829870 (0.275581)	0.949055 (0.318074)	-0.368436 (-0.123721)
Tier	-0.518744 (-0.160999)	-0.440797 (-0.121585)	-0.887621 (-0.257964)	1.924496 (0.636182)	1.030321 (0.334049)
N	65	65	65	65	65
F-statistic	**6.831099*****	**6.237095*****	**6.561329*****	**6.811332*****	**6.371190*****
R-sq	0.414062	0.392177	0.404322	0.413359	0.397259
Adj R-sq	0.353448	0.329299	0.342700	0.352672	0.334907

Notes: †p < 0.10. *p < 0.05. **p < 0.01. ***p < 0.001. The t-statistic for each coefficient is reported in parentheses. The description of the variables is provided in *Table 1*.
Source: Authors' computations.

Thus, we notice a positive influence of SW-CSR global index on Tobin's Q ratio adjusted according to activity sector (Eq 1), similar Akpinar *et al.* (2008) and Choi *et al.* (2010). An analogous relationship was registered also between CSR subindex on the quality, safety, and effectiveness of the products and services and firm value (Eq 4). Moreover, the association between the other designed SW-CSR subindices and firm value was not statistically validated (Eq 2, Eq 3, and Eq 5). Besides, based on the values related to centered VIFs, there are no concerns regarding multicollinearity. Likewise, based on the values of R-sq, we notice, on average, that 40.95% of the variance regarding firm value can be explained by EW-CSR global index and related subindices. Besides, according to most commonly rule of ten associated with VIFs (see *Table 8*), we ascertain the lack of multicollinearity.

Table 8. VIFs for the estimations towards the link between EW-CSR global index and subindices on firm value

Variables	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5
CSRGI_SW	1.299242				
SOCIAL_SW		1.549739			
RHSSDE_SW			1.576643		
QSEPS_SW				1.211147	
ENV_SW					1.138524
Size	1.504735	1.396005	1.513353	1.328261	1.324335
D/E	1.184235	1.174247	1.216902	1.181297	1.185855
SG	1.096337	1.122672	1.094354	1.084581	1.132719
Listing	1.032177	1.063643	1.074227	1.070878	1.038232
Tier	1.330476	1.623819	1.492529	1.171377	1.185201

Notes: The description of the variables is provided in *Table 1*.
Source: Authors' computations.

As well, by considering the influence of firm-level control variables on firm value, we notice a negative influence of firm size on Tobin's Q ratio adjusted according to activity sector (in all the estimated models out of *Table 5* and *Table 7*). For the rest of included firm-level controls, we did not find a statistically significant relationship.

Table 9 reveals the output of T-test. The null hypothesis is rejected since there is a statistically significant difference between CSRGI_EW, SOCIAL_EW, SOCIAL_SW, RHSSDE_EW, RHSSDE_SW, and ENV_EW of listed companies on the first tier and listed companies on the second tier.

Table 9. Output T-test

Variables	Mean Tier 1	Mean Tier 2	t-value	df	p	SD Tier 1	SD Tier 2	F-ratio Variances	p Variances
CSRGI_EW	**18.2667**	**11.6600**	**3.4879**	**63**	**0.0009**	**6.5407**	**6.4035**	**1.0433**	**0.8585**
CSRGI_SW	5.5048	4.1390	1.4626	63	0.1485	1.9764	3.4380	3.0261	0.0269
SOCIAL_EW	**6.2667**	**2.5600**	**4.1740**	**63**	**0.0001**	**3.0582**	**3.0045**	**1.0361**	**0.8713**
SOCIAL_SW	**2.0796**	**0.7456**	**3.7927**	**63**	**0.0003**	**1.3850**	**1.1345**	**1.4904**	**0.3007**
RHSSDE_EW	**2.8667**	**1.9200**	**2.7946**	**63**	**0.0069**	**1.3020**	**1.1036**	**1.3919**	**0.3861**
RHSSDE_SW	**0.4685**	**0.3167**	**2.7173**	**63**	**0.0085**	**0.2156**	**0.1817**	**1.4079**	**0.3709**
QSEPS_EW	2.3333	2.3400	-	63	0.9864	0.9759	1.4086	2.0833	0.1338
QSEPS_SW	0.3494	0.4790	-	63	0.1778	0.1721	0.3546	4.2447	0.0049
ENV_EW	**6.8000**	**4.8400**	**2.5570**	**63**	**0.0130**	**2.3361**	**2.6754**	**1.3116**	**0.5953**
ENV_SW	2.6074	2.5977	0.0120	63	0.9904	0.9940	3.0473	9.3996	0.0000

Notes: The description of the variables is provided in *Table 1*.
Source: Authors' computations.

Concluding remarks and further research directions

Current paper explored the link between the application of the CSR policies and the value related to listed companies in Romania, thereby contributing to the development of CSR subindices corresponding to four explored fields, as well as a CSR global index. Thus, there resulted, on average, a reduced concern of the companies towards unfolding actions in the social domain; the rights, health, safety, security, and development of the employees; ensuring the quality, safety, and effectiveness of the products and services; environmental protection. Therefore, by employing an equal-weighted approach in order to compute the CSR global index and CSR subindices, the research hypothesis is validated with the exception of the CSR subindex related to environmental protection. In addition, by assuming a stakeholder-weighted approach, the research hypothesis is validated only for the CSR global index and CSR subindex on the quality, safety, and effectiveness related to products and services. However, unconcerned to the weighting approach, the results provide support for a lack of statistical significance towards the link between CSR subindex on environmental protection and Tobin's Q ratio adjusted according to activity sector, thus the research hypothesis being rejected. Furthermore, we emphasize that there is a difference between the average CSR aggregate measures of listed companies on the first tier and listed companies on the second tier. The limitations of current research emerge from the reduced number of statistical observations due to non-reporting of CSR undertakings by the listed companies in Romania. As future research avenues, our purpose is to extend the research sample and the CSR policies questionnaire designed in order to construct the CSR global index and CSR subindices.

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