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Article

The Influence of Environmental and Social Performance on Financial Performance: Evidence from Romania's Listed Entities

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Abstract: Companies that are listed on a stock exchange should know that reporting only financial measures is not enough for ensuring sustainable development. To be truly competitive, they should also include information about environmental policies and about the benefits that the company offers to its employees. The present research aims to provide information on how Romanian listed companies report environmental and social indicators and whether or not this has an impact on financial performance. We used a four time period panel fixed effect model for Romanian companies that are listed in the first category of the Bucharest Stock of Exchange. The results point out that increasing water, air and soil protection has a negative impact on current return on equity, while no effects were detected on return on assets and stock market returns. Other environmental variables such as gas, energy or sound were found not to be statistically significant. Training and benefits after retirement have a mixed effect on financial measures. The research correlates Romanian accounting regulation changes with companies' characteristics and the influence of financial audit on financial performance, and concludes that increasing environmental and social protection could have an impact on financial performance in the long run, as positive

correlation was detected between social or environmental performance and stock market returns one year after the changes occurred.

Keywords: environmental reporting; social reporting; financial auditor; financial performance; International Financial Reporting Standards (IFRS); panel model; Stock Exchange; Romania

1. Introduction

Each stakeholder of a company aims to obtain proper and reliable information about it, both of a financial and of a non-financial nature. The entity should provide information based on which investors can make proper and adequate decisions. Companies should report their financial statements according to objectiveness and transparency principles and should aim to meet the long term interests of their stakeholders [1,2]. Nowadays, investors are looking at indicators that provide information about the sustainability component of businesses [3]. Sustainability accounting is strongly correlated with the principles of sustainable development

Recent theories present the idea that the accounting measures should not have an influence on the sustainability development of the entity—rather they should affect the principle of profit maximization [4]. Consequently, the sustainability process should be established in the long run [5] and it should be a combination of social, environmental and financial elements, as all are inter-correlated [6]. The social and environmental indicators can add qualitative value to a company and consequently impact the financial performance [7]. Otherwise, the development of the company can be established only in the short run [8], as financial measures are not enough to predict and to ensure the sustainable development of an entity whatever the firm's field may be.

There is an endless discussion about the relationship between the financial performance (FP) and the social performance. The first issue that can be found in the literature is related to the fact that social performance has several ways in which it can be quantified, while financial performance is a clear cut process [9,10]. The corporate social performance (CSP) is a measure of corporate social responsibility (CSR) as it presents the outcomes of a behavior that is socially responsive [11]. The relationship between the CSP and the FP is considered to be mixed, mainly because it is not clear how these two elements should be related [11].

On one hand, there is no evidence that a relationship between the CSP and profitability exists, [12] considering the legal, the economic, the ethical and the discretionary components of the CSP. An explanation of this could be that econometric models where a relationship is detected [10] are miss-specified as they do not take into account the level of investment in R&D. It seems that the level of investment in R&D is highly correlated with the CSP [9]. Similar conclusions are reached regarding the relationship between a composite measure of the CSP and the accounting financial performance measures for Canadian companies [13].

Not only is the R&D component important, but there is evidence that if the industry effect is left out, then the estimated models can be miss-specified [14]. Industry can refer to a wide range of areas such as the banking industry [15], the petroleum gas industry [16], the mineral industry [17], and others. The results seem to vary across industries and depend on the firm size [18]. The relationship

could also be sensitive to how the FP is measured. Several studies used accounting measures for quantifying the FP [19,20]. The problem is that they are backward looking and thus the results can be questioned. Recent studies use stock market measures, which are forward looking, either as returns [20] or as value relevance models [21,22]. The evidence found on return studies [23,24] raises the question: if high CSR generate lower returns on stock market because entities have a lower cost of capital as a consequence of poor management, which impacts the CSR strategies. Alternatively, the long run returns could be subject to less market risk, and thus the firm value would be sensitive to future cash flows and to the cost of capital [25,26].

If we consider the stakeholder theory then a positive relationship is detected between the CSP and the FP. It seems that entities which improve their CSP measures are going to obtain higher financial performance than their competitors [18]. The effect is especially significant if a long term relationship between the two components is analyzed. In fact, most of the studies provide evidence of a positive correlation between the FP and the CSP. The results were disseminated in several meta-analysis studies and narrative reviews [13,27–31]. What is interesting is what a positive correlation means. In some cases, a positive correlation refers only to a positive influence of CSP on FP or of FP on CSP [32]. In other cases, the authors classified the results as being a positive correlation even though weak CFP is related to poor CSP [28]. This assumption could be valid as the two elements move in the same direction.

There are also studies that present a negative relationship between the FP and the CSP. Companies that have a good CSP (CSR) may have low levels of returns on the stock market or smaller values for return on equity [33]. In fact, if managers aim to obtain private benefit, they are going to neglect the interests of their stakeholders [34]. It is considered that the principle of value maximization is invalidated if the entity is focusing on CSP [35]. In this case, the firm has low financial performance and is less competitive than the entities that are less socially responsible [36]. It can be seen, there is not a proper conclusion about the relationship between the FP and the CSP. The direction of causation is also a questionable issue. If we consider the stakeholder theory, then improving social performance will generate higher financial performance [37]. The reverse relationship is also valid. It is considered that failures to achieve stakeholder's interests generate higher risk premiums, higher costs and lower profitability [36]. CSP impacts the following year's FP.

If we consider the trade-off hypothesis then companies that have a high level of CSP have lower value of financial performance. In this case, the CSP is the independent variable. The hypothesis is based on the assumption that the main aim of a company is to obtain profit [38], thus the entities that are highly socially responsible have a decreased stock market value.

In case we take into account the found hypothesis, then the FP may influence the CSP. As there is a fundamental need for resources in order to fund social projects, profitability in one year will determine high CSP in the next period of time. This lag was tested in [39].

Another theory that we have to consider regarding the direction of causation between the FP and the CSP is based on managerial opportunism theory. It is suggested that managers will act in order to gain private benefits. In this case, when the firm is high FP, the number of corporate social activities will decline and vice versa, when the company is low FP, the managers will increase the number of corporate social activities.

There is also a possibility that a synergetic effect between the FP and the CSP could be revealed [36]. This means that fluctuations in FP are contemporaneous with fluctuations on CSP.

These results are in general related to the context and can fluctuate depending on country, industry, period chosen for analysis, different ways of establishing the CSP or different methodological approaches.

In fact, there is an entire discussion on how social and environmental activities influence on the financial performance, [40] as these activities are difficult to be measured. On the other hand, the entities are in general interested in measuring them since their effective implementation can bring them benefits [41]. Thus, it is difficult to say if socially responsible companies out-perform companies that are less socially responsible [9,42], as mixt evidence was found both on long term and short term analysis. According to some studies [42,43] it is hard to establish the effectiveness of CSR. This is due to the fact that profit can also be influenced by quantitative elements such as the employees' morale, the image of the corporation, the goodwill, the reputation and the public opinion.

Opposite conclusions were also found when the correlation between environmental indicators and FP is encountered. For environmental elements, several indicators are frequently analyzed such as the emission of gas, avoidance of air, soil and water pollution activities, energy and gas efficiency, avoidance of sound pollution and of waste. Considering financial measures, the return on assets, return on equity, earning per share or return on investment are only a few indicators that are frequently used. Positive correlation was detected between financial performance and the existence of environmental quality standards [44,45], while other researchers do not find any correlation between them [46,47]. There are also studies that show mixed relationships between financial and environmental indicators. For example, waste emission does not influence the financial performance, while greenhouse gas reduction does have a positive influence on the financial performance [48].

When the social feature is encountered the same mixed results are reported. It has to be noted that the social dimension does include information regarding the benefits that the employees receive after retirement, working conditions, the number of workplace accidents, the specialization or the improvement courses that an entity provides annually or not for its employees. Mixed results consist of both positive and negative (no influence) correlation between financial performance and social indicators [49]. It can be concluded that the financial information is sensitive to the independent variables and to the way of estimating.

It has to be mentioned that the environmental and social indicators are deeply correlated with several ways of reporting such as ISO (International Organization for Standardization) standards that are based on several concepts: safety, economy, reliability or environmental reporting measures or the OHSAS (Occupational Health & Safety Assessment Series) management system standards that relate to occupational health and safety indicators. In general, their purpose is to increase the quality of products and to create proper and secure working conditions. This means that the negative impact on the environment is mitigated and that there is no violation of working conditions. A better protection for the employees is also encountered.

The problem that the literature presents is that even though these standards are implemented and guide the activity of the company, their influence on financial performance could not be observed as the financial information can be manipulated by financial managers in order to gain private benefits [50]. The solution seems to come from a financial auditor who should analyze the financial statements and should provide an objective opinion on the fairness of financial information. Based on auditor credibility and on legal enforcement, the auditor report presents the mistakes done in financial reporting [51]. Moreover, the companies that are audited by the entities that are part of the BIG 4

group (KPMG, Ernst &Young and Deloitte Touche Tohmatsu). In the past, the BIG 5, BIG 6, BIG 7 or BIG 8 group, have a higher probability to report reliable financial information [52].

The impact of the auditor on financial performance is not the only important factor, the correlations between financial performance and environmental and social indicators are also relevant. There is evidence ([53,54]) that the estimation method does indeed influence the financial performance. It seems that panel data analysis provides better estimation results because the firm specific unobserved time-invariant factors can be controlled. Consequently, the influence of omitted variables can be mitigated by using this estimation technique.

In Romania, the environmental, social and governance policies are in accordance with the European regulation. In order to align to European Sustainability principles, Romania adopted in 2007 the national strategy for sustainable development. The strategy looks both at environmental protection and at ensuring long-term sustainability. The strategy was substituted in 2009 with the National Strategy for Sustainable Development, 2013–2020–2030. There are also specific environmental regulations that the entities must adhere too and a 2011–2016 national strategy for promoting the social responsibility activities.

Considering these elements, the idea of our research is to provide information about the influence of environmental and social elements on the FP for the companies that are listed in the first category of Bucharest Stock Exchange (BSE). The interest in this topic comes from the fact that, we want to achieve evidence about the relationship between the social and the environmental features and financial performance of listed companies. The influence could be observed in the same year when an improvement in corporate and environmental indicators occurred or one year lagged. Moreover, according to Romanian regulation, starting with 2012, the entities that are listed on stock exchange have to report their individual financial statements using the International Financial Reporting Standards (IFRS) [55,56]. The literature emphasizes that in general higher financial performance is obtained after the adoption of the standards as there is much more transparency in reporting [56,57]. This could also affect the relationship between the FP and the CSP. The results are important considering the fluctuations that exist at the macroeconomic level because of the financial crisis. The results could provide evidence about how to assess the correlation between the FP and the environmental and the social performance for listed Romanian companies. By knowing the direction of causation and the relationship between FP and environmental and social performance, the investors will assume more or less risk and could manage where to assign their investments. Moreover, the results could provide information about the entities that are corporate-social responsible and if their financial performance is going or not to be improved after the implementation of the corporate-social and the environmental activities. We based our assumption on the fact that better environmental performance should bring benefits to a company as environmental pollution is a sign of inefficiency [58,59].

The structure of the remaining paper is divided in several sections. Section 2 refers to the methodology of research. Section 3 presents additional analysis where we use additional measure for financial performance: stock market returns and we have controlled for industry, Section 4 focuses on the empirical results, while Section 5 provides information about the conclusions of the research, its problems and further development of it.

2. Methodology of Research

The idea of research the study is to provide evidence about the factors (environmental or social) that can impact on the financial performance of Romanian companies, which are listed in the first category of Bucharest Stock Exchange, considering the post crisis approach. Several changes have been encountered in Romanian since the financial crisis has been released, such as: significant fluctuation of share's price, changes in investor's type and also changes in accounting measures that the Romanian listed entities have to apply.

As the adoption of environmental, social and governance elements are quite new in Romania and considering that the Romanian accounting regime suffered a change in 2012 (all listed companies have to provide their individual financial statements according to international regulation), we decided to conduct an analysis using a panel model approach. The results could reveal information about the financial performance of the companies that are corporate-social responsible and could influence the behavior of financial investors.

For the entities that are listed in the first category of BSE financial data was collected for a four year period of time. The period was chosen to be between 2010 and 2013 (there are other studies that are conducted on a four year period of time which use panel data analysis ([17]—there is a four year panel analysis, [60]—the analysis is conducted on the same period of time)). The period covers a period of economic crisis and contains the newest financial data. Between these years, the listed entities have to use two accounting systems for their individual financial statements. The panel approach is frequently used in cross sectional analysis and is it can also provide information about the influence of the accounting measures on financial performance of the company.

Currently, there are 30 companies that are listed in the first category of BSE, one of them being traded at international level. These companies also include several banks and investment societies. From these companies, only a few have to report their individual financial statements using the International Financial Reporting Standards.

According to Romanian National Securities Commission updated document [61] there are 18 companies listed in the first category that have to comply with this regulation. Among them, there are two companies: COFI and OLT (these are the symbols under which the companies can be found on BSE) that have a negative value of equity, either when the Romanian or the international reporting manner is used. The first one has a negative value of shareholder's capital in 2012 when the IFRS are used, while the second one has a negative value of this indicator both under the two accounting reporting techniques (negative value for 2010 and 2011 under Romanian regulation—Romanian Accounting Standards, known in the literature as RAS—and negative value for 2012 under IFRS approach).

The company's field is also important. The companies were classified according to Romanian Nomenclature of Economic Activities Code (NACE code). Table 1 summarizes their main activity.

Table 1. Field of activity of the companies included in the sample.

Symbol	Field activity	Symbol	Field activity
ALR	Manufacturing industry	PREH	Manufacturing industry
ATB	Manufacturing industry	RPH	Wholesale and detailed trade
BIO	Manufacturing industry	TGN	Transportation and storage
TEL	Production and supply of electric and thermic energy, gas, hot water and air conditioning	SOCP	Transportation and storage
ELMA	Manufacturing industry	TBM	Manufacturing industry
IMP	Construction	COTE	Transportation and storage
OIL	Transportation and storage	SNN	Production and supply of electric and thermic energy, gas, hot water and air conditioning
SNP	Extractive industry	SNG	Extractive industry

Note: the symbol field provides evidence about the symbols under which the companies can be found on BSE.

For each company, financial data, such as information about the value of current assets, total assets, current liabilities, long term liabilities, shareholder's own capital and the value of net profit was manually collected. It has to be specified that the financial data also includes information regarding the accounting regime. Consequently, for 2010 and 2011 data according to national measures (RAS: Romanian Accounting Standards) was taken, while for 2012–2013 data using IFRS approach was released as this is the only way Romanian companies can report their financial statements. The information found on the BSE reveals that financial data is in accordance with the regulation of the Romanian Ministry of Finance for all reported periods of time.

The accounting measures that we used for financial information were the return on equity (ROE) and the return on assets (ROA). These two measures have been frequently used in the literature [13,27–31]. We have also conducted a sensitive analysis, where the stock market returns were used [21,22] as dependent variable. The idea was to reveal on which type of financial measures the CSP fits better and if any gains for shareholders are going to be encountered.

In order to see if there is a difference in the way the financial performance measures are constructed, we used two different ways of establishing the accounting financial indicators.

For the ROE indicator, we used the approach presented in Equation (1)

$$ROE = \frac{Net\ Profit_n}{Shareholder's\ equity_{n-1}} \quad (1)$$

where *Net Profit* is the profit that the company obtained in the analyzed period, *Shareholder's equity* is the value of the company's own equity and *n* is the period over which the analysis is conducted.

In order to determine the values for ROE for 2010, data regarding shareholder's equity for 2009 was also collected. We consider that this measure of performance is the ratio between the value of net profit and initial resources and is computed in order to be comparable with the way the rate of inflation or the economic growth is established.

The second measure for financial performance was ROA. This time we decided to use a different approach for establishing the financial indicator. The way the indicator is computed is presented in Equation (2).

$$ROA = \frac{Net\ \ Profit_{\ n}}{Total\ \ Assets'\ value_n} \quad (2)$$

where *Net Profit* is the profit that the company obtained in the analyzed period, *Total Assets' value* is the value of total assets that the entity has and *n* is the period over which the analysis is conducted.

This time the financial indicator is constructed by dividing the final results by the value registered at the end of the year which also includes the changes that occurred in the analyzed period. The idea is to reveal which individual factors impact on the financial indicators regardless of they are computed.

The financial performance indicators were used in the analysis as dependent variables.

Regarding independent variables, based on financial data already collected, several other indicators were established such as firm-size (measured as the log value of total assets), liquidity rate (measured as the ratio between current assets and current liabilities) and debt or leverage indicator (measured by diving the value of total debt-both current and on long term by the value of shareholder's equity).

Not only financial measures were taken into consideration as independent variables, but also other variables that have a qualitative aspect. For each entity and for each year, data from the report of the board of directors was also manually extracted. We consulted the documents and we took the data that refers to several aspects. First of all, information about environmental improvements or declines has been reported by the company at the end of each year. As such, we took data regarding the impact of the entity's activity on the environment. We analyzed each document and we collected information regarding any mention of energy usage, its efficiency and that of gases, the usage of water, waste, the impact of the company's activity on the soil, air and if there is evidence about sound pollution. The data is not available in terms of emissions, so we could not scale them according to sales or according to the size of the staff. The data is reported as text (for example, in 2011 a company minimized the quantity of waste and managed them in safety conditions when there appearance could not be avoided, improved the quality of waste water, reduced the emission of gases in the air, reduced the use of natural resources). We use dummy variables in order to quantify each effect. If any specification about an improvement of the environmental variables was noticed then the dummy variable took value one. Otherwise, if no specification of the encountered variables was found or a negative impact was detected, the dummy variable took value zero. We also took information regarding if any updating to ISO of OHSAS standards was achieved in the analyzed period of time or if a new quality measure (both from the environmental point of view and from the security area) was obtained.

Qualitative information regarding the auditor type, the benefits after retirement, the existence of specialization and improvement courses (the second and the third characteristics are considered to be social elements) and information regarding the research and development activity was also collected. The way it was quantified was similar to the way the environmental features were quantified. For financial auditor variable, value one was conferred to its dummy variable if the financial auditor is among BIG 4 companies, while for the other type of financial auditors; the dummy variable took value zero. We also constructed a variable that provides information about the accounting measures that the company used. In general, due to the fact that for 2010 and 2011 we have RAS regulation, value zero was conferred to the dummy variable. It was considered that reporting under IFRS should consist of higher transparency for financial reporting.

In order to see if there is any correlation between environmental, social, other qualitative variables and the independent financial elements, we used the panel data analysis method. Before conducting the analysis, we performed additional tests on the value of ROE and ROA in order to see if there are any differences in mean, median and variance considering the two accounting approaches which can influence the investor's perspectives. Thus, we provide our first hypothesis of research:

H1: There is a statistically significant difference between the values of ROE and ROA when national and international accounting approaches are used [62,63].

We also constructed the correlation matrix in order to see if there are any variables that are multi-collinear and that cannot be used simultaneously in the analysis. As a change in environmental or social variables is, in general, correlated with another change, we think that using dummy variables might be a little bit tricky, but there is no better method of quantifying them considering how the data is provided by each company.

The model on which we based our analysis has the form presented in Equation (3).

$$\begin{aligned} Fin\ perf_{it} = {} & \alpha_{it} + \beta_{it} \times financial\ meausres_{it} + \gamma_{it} \times IFRS\ \mathrm{var}_{it} + \delta_{it} \times Auditor\ type_{it} + \eta_{it} \times R\&D\ \mathrm{var}_{it} \\ & + \lambda_{it} \times dummy\ (env./social)_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

where *fin perf* is our dependent variable such as: *ROE* or *ROA*, *i* measures the cross sectional effect and *t* measures the period effect. If the model on which we base our estimations is fixed than the intercept will include the individual effect, it varies over companies—Equation (4), varies over time—Equation (5) or both—Equation (6):

$$\alpha_{it} = \alpha_i \quad (4)$$

$$\alpha_{it} = \alpha_t \quad (5)$$

$$\alpha_{it} = \alpha_{it} \quad (6)$$

where β is the value of coefficient for financial variables, *financial measures* could be size, debt or liquidity (at least two of this variables are going to be taken into the analysis, the ones that provide the results that best fit the analysis), γ is the coefficient of IFRS variable, *IFRS var (IFRSDV)* is a dummy variable that takes value one when the accounting financial measures are under IFRS, δ is the coefficient of auditor type variable, *auditor type (AudDV)* is a dummy variable that takes one if the financial auditor is among BIG 4 companies, η is the coefficient of research and development variable, *R&D var (R&DDV)* is a dummy variable that takes value one if the company has research and development activity in the year of analysis, λ is the coefficient for environmental or social dummy variables, *dummy variables* can be environmental dummy variables such as: *energy dummy variable (EDV)*, *gas dummy variable (GSV)*, *water dummy variable (WDV)*, *air dummy variable (ADV)*, *waste dummy variable (WSDV)*, *Soil dummy variable (SDV)*, *Sound dummy variable (SDDV)* and *new quality standard dummy variable(NDV)* or social variables such as *training dummy variable (TDV)*, *benefits after retirement dummy variable (BRDV)*, while the error term does not have the classical assumptions. It could be correlated with individual effects.

The random effect model is implemented if it offers better results than those provided by fixed effect model. The difference between fixed effect models and random effect models is that on one side

the constant term does not vary across elements anymore, aspect that is presented in Equation (7), while the error term (noted ω) has two components which are presented in Equation (8). The new component of the error term has the properties presented in Equation (9).

$$\alpha_{it} = \alpha \tag{7}$$

$$\varpi_{it} = \mu_{it} + \varepsilon_{it} \tag{8}$$

$$E(\mu_i) = 0,\ Var(\mu_i) = \sigma_\mu^2 \tag{9}$$

In order to choose between the fixed effect model and the random effect model, the Hausman test is recommended to be performed. Its null hypothesis is that the random effect model is a better estimator than the fixed effect model. Considering the probability associated with it, the decision about which model performs best is properly made.

The relationship between accounting financial measures variables and environmental or social changes was based on the existence of contemporaneous effect, while the relationship between stock market returns (the financial measure used in the additional analysis) and the improvements or not of environmental elements was considered to be one lagged time. We based our analysis on these assumptions considering the fact that the entities that we have included into the analysis are expected to provide transparent information to their stakeholders. Consequently, the adoption of the CSP measures or of the environmental measures should be reflected both on accounting measures in the year of adoption, while they could have an influence on stock market return one year after they occurred considering that at the end of the year the companies should make out their annual report. We think that improvement of environmental elements can attract new investors and can impact on the positive performance of the entity. All the activities that the companies conduct have to be revealed in financial information.

Based on data presented, we can reveal our second and third hypotheses of research.

H2: The improvement/ the existence of environmental reporting variables do impact the financial performance indicators, but its effect is uncertain [18,48,64].

H3: The improvement/ the existence of social reporting variables are correlated with the financial performance indicators and their influence is negative in the short run [64].

3. Additional Sensitive Analysis

In order to provide evidence about the relationship between the FP and the CSP, or between the FP and the Environmental performance, we conducted additional analysis. In this case, we included new variables: the age of the company (AGE) and its industry. According to the data presented in Table 1, the industry was split into two main categories: **production industry** (PIDV), which includes the manufacturing industry, the transportation and storage field, extractive industry and construction and **service industry** (SIDV). In this category, we have the wholesale and detailed trade company and the companies that are specialized in transportation and storage. The first category includes 44 observations, while the second has only 20 observations. Each of the variables that focus on one industry was coded as a dummy variable. The variable takes value one when the company is part of a specific industry. More details about the classification can be found on Appendix.

In order to provide evidence about the results obtained from conducting the additional analysis, we also constructed the correlation matrix. Similar with previous assumptions, we have excluded from each model the variables that are highly- correlated in order to avoid multi-collinearity problems.

In this case, the dependent variable was measured though stock market returns. We have collected the stock prices of each company from a Romanian financial site (www.ktd.ro). The data were collected for the period between 2010 and 2014. The estimations were done by using the short term effect.

For measuring the short term effect, the return of stock prices was computed by dividing the end year stock price to the beginning year stock price. The formula that we used for establishing annual return can be seen in Equation (10).

$$RTN_{n+1} = \frac{P_{n+1\,end}}{P_{n+1\,beginning}} \tag{10}$$

where RTN_{n+1} represents the stock market return one year the adoption of the corporate and of the environmental behaviors occurred, $P_{n+1\,end}$ is the price of the stock at the end of the year n+1, $P_{n+1\,beginning}$ is the price of the stock at the beginning of the year n+1.

We tested the influence of the same variables on stock market returns. In this case, in Equation (3), the financial performance is measured by stock market returns, while the individual factors are the same. The new form of the Equation (3) can be seen in Equation (11).

$$\begin{aligned} RTN_{n+1it} = {} & \alpha_{it} + \beta_{it} \times financial\ \ measures_{it} + \gamma_{it} \times IFRS\ \mathrm{var}_{it} + \delta_{it} \times Auditor\ type_{it} + \eta_{it} \times R\ \&\ D\ \mathrm{var}_{it} + \\ & + \lambda_{it} \times dummy(env./social)_{it} + \varepsilon_{it} \end{aligned} \tag{11}$$

where the *Financial measures* are size, debt or liquidity (at least two of these variables are going to be taken into the analysis, the ones that provide the results that fits better the analysis).

After that, we split the companies into production and services industries, which could be similar with dirty and clean industries [48]. We conducted the analysis both on the whole sample and on sub-samples, considering the field that each company has. We also repeat the subsample analysis for the accounting financial measures.

For the companies that are part of production industries, we re-estimated the Equation (3) and the Equation (11) by using the Equation (12).

$$Fin\ \ perf_{n\,it} = \alpha_{it} + \beta_{it} \times financial\ \ measures_{it} + \eta_{it} \times R\ \&\ D\ \mathrm{var}_{it} + \lambda_{it} \times dummy(env./social)_{it} + \varepsilon_{it} \tag{12}$$

where *fin perf* is ROE, ROA or stock market returns, *financial measures* is size, debt, liquidity or age (we controlled for firm size and age (both variables are included into the analysis), and we use one more additional variable: debt or liquidity for the financial performance measured by ROE and ROA. Their selection was done according to the results that fit better the analysis. For the stock market returns, we used both variables (debt and liquidity). We have excluded the auditor variable as it high correlated with the size of the company. We have excluded IFRS variable as its effect is not statistically significant from zero (considering previous analysis).

For the companies that are part of services industries, we re-estimated the Equation (3) and the Equation (11) by using the Equation (13).

$$\begin{aligned} Fin\ \ perf_{n\,it} = {} & \alpha_{it} + \beta_{it} \times size\ \ or\ \ age_{it} + \delta_{it} \times debt\ \ or\ \ liquidity + \eta_{it} \times R\ \&\ D\ \mathrm{var}_{it} + \\ & + \lambda_{it} \times dummy(env./social)_{it} + \varepsilon_{it} \end{aligned} \tag{13}$$

where *fin perf* is ROE, ROA or stock market returns. As the number of observation on which the analysis is conducted in only 20, we cannot include more than 4 individual variables. As a fact, we included either the firm size or firm age variable, considering the one that provides better results. We included either the debt or liquidity variable, considering the one that provides better results. The last two variables are the R&D variable and a variable that refers to the environmental or to the social indicators. As the analysis is conducted on 2010–2013, we do not have the possibility to test the relationship between the FP and the CSP or the environmental performance in the long run. The only way of testing a longer relationship is by measuring the stock returns on a longer period of time. In this case, we would need to exclude at least 3 companies that are listed from 2013 (SNN, SNG, COTE). We still have another 2 companies that were listed in the middle and at the end of 2011 (ELMA, RPH) and one company that was listed in the middle of 2010 (PREH). So we will have only ten companies included into our analysis. If the longer perspective is considered then we have also to exclude the data corresponding to recent years. Consequently, the entire analysis will be conducted on a smaller sample and could be biased.

4. Results and Discussion

4.1. Descriptive Statistics of the Variables Included into the Analysis

In order to conduct our analysis and to acknowledge the influence of the CSP and of the environmental elements on the FP, we firstly provide evidence about the characteristics of the variables used. Table 2 presents the results found for dependent variables; Table 3 reports the characteristics of qualitative individual variables, while Table 4 presents the characteristics of the dummy variables.

Table 2. Descriptive statistic for dependent variables.

Dependent variables			
Element	ROE	ROA	RTN_n
Mean	0.0802	0.1569	0.0266
Median	−0.0033	0.0578	0.0342
Maximum	3.7304	7.4337	0.1250
Minimum	−0.6246	−0.331	−0.174
Standard deviation	0.6131	0.9300	0.0677
Skewness	3.7154	7.6537	−0.9987
Kurtosis	21.384	60.427	3.8491
Observations	64	64	64

From Table 2, it can be seen that the median value of ROE is 8.02%. It can be observed that there are companies where the investors have the minimum value of −62.46%, while others have a profitability of more than 373%. Regarding the values of ROA, same discrepancies can be observed. While the average is around 15.69%, the minimum value is −33.1% and the maximum value is higher than the one found for ROE. Looking at the annual returns, smaller fluctuations could be observed. The average annual return is around 2.66%, the minimum value is −17.4%, while the maximum value is 12.50%.

Table 3. Descriptive statistics for the independent quantitative variables.

Independent quantitative variables				
Element	Size	Debt	Liquidity	Age
Mean	8.9903	0.6055	3.2537	56.375
Median	8.6584	0.3145	2.1029	57.5
Maximum	10.589	4.451	15.6701	113
Minimum	7.9988	0.0361	0.5873	13
Standard deviation	0.7530	0.8800	2.9335	32.3745
Skewness	0.6320	2.5721	2.1459	0.1421
Kurtosis	2.1176	9.3420	8.3338	1.5504
Observations	64	64	64	64

From Table 3, it can be concluded that the entities included into the analysis are around 40% indebted if we consider the ratio between total debts and total funds and approximately 60% indebted if we take into account the ratio between total debts and own capital. As we can see the companies have no problems with the liquidity indicator. The youngest entity from our analysis was 13 years old at the end of 2010. The oldest company was 113 years old at the end of 2013. The average age of the companies included into the analysis is around 57 years and a half. As it can be observed, neither of the independent qualitative variables has a normal distribution.

From Table 4, it can be seen that the entities do not provide information about any improvement in the gas component (only 14.06% from our companies report such data), in the sound pollution (only 15.63% from our companies report information about the sound pollution) and few entities offer benefits after retirement for their employees (only 15.63% companies). As these variables are dummy variables, it is expected that the minimum level to be zero and the maximum level to be one, which means that there is information about the encountered variable. A higher degree of attention was given to air and water pollutions and to the management of waste. Another important element is that more than half of the companies provide trainings and inside courses to their employees (on average 57.81%). Regarding the industry field, it could be observed that approximately 68.75% of the companies that were included into the analysis belong to the production field, while the rest are belonging to the service area. None of these variables has a normal distribution.

Table 4. Descriptive statistics for independent qualitative variables.

Element	ADV	WDV	WSDV	EDV	GDV	SDV	SDDV	NDV	TDV	BRDV	R&DDV	AudDV	IFRSDV	PIDV	SIDV
Mean	0.4688	0.5469	0.5	0.2656	0.1406	0.3281	0.1563	0.3438	0.5781	0.1563	0.6250	0.4688	0.4844	0.6875	0.3125
Median	0	1	0.5	0	0	0	0	0	1	0	1	0	0	1	0
Max	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Std. dev	0.5029	0.5017	0.5039	0.4451	0.3503	0.4732	0.3659	0.4787	0.4977	0.3659	0.4879	0.5029	0.5037	0.4671	0.4671
Skewness	0.1252	−0.1883	0	1.0613	2.0675	0.7321	1.8934	0.6579	−0.3163	1.8934	−0.5164	0.1252	0.0625	−0.809	0.8090
Kurtosis	1.0156	1.0354	1	2.1264	5.2747	1.5359	4.5851	1.4329	1.1001	4.5851	1.2666	1.0156	1.003	1.654	1.6545
Obs	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64

4.2. Comparison of ROE and ROA Considering Both Accounting Measures

The purpose of the study is to reveal what are the environmental and social factors that impact on the financial performance of the Romanian listed companies from BSE's first category. The results could influence the behavior of the shareholders and of the other investors. Firstly, the values of financial performance indicators were compared using financial data from 2010 to 2013. Both the values reported under the same accounting measure and the values established due to different accounting regimes were compared in terms of mean, median and variance. The reason for doing this is because we want to see if there is any significant difference in the way of reporting. The comparison between RAS and IFRS is also important as we consider the fact that the effect of applying the international regulation could be seen in long run. The justification is found in the literature which states that the lack of guidance for implementing the international standards, their features and the cost of switching from the national regulation to the international one can mitigate the impact of their adoption [65,66].

Table 5 presents the value of mean, median and variance for each period of time and it provides the probability associated with specific tests, performed to measure the difference between their values.

Table 5. Comparison between return on equity (ROE) values computed using Romanian Accounting Standards (RAS) and International Financial Reporting Standards (IFRS).

Element/Year	2010	2011	2012	2013
Mean Values	0.5153	0.0538	0.0092	0.0495
p value- for 2010 values		0.3263	0.2830	0.3218
p value- for 2011 values			0.3011	0.9063
p value- for 2012 values				0.3441
Median Values	0.0588	0.0561	0.0396	0.0669
Wilcoxon for 2010 values		0.9858	0.3758	0.8358
Wilcoxon for 2011 values			0.3758	0.9850
Wilcoxon for 2012 values				0.3964
Variance Values	1.8466	0.1042	0.1335	0.1011
Levene Test for 2010 value		0.0598 *	0.0658 *	0.0583 *
Levene Test for 2011 value			0.5464	0.8385
Levene Test for 2012 value				0.4361

Note: * denotes statistically significant at 10%.

From Table 5 it can be noticed that there is no significant difference in the value of mean or median of ROE during the period that we analyzed. In contrast, the difference between the values of variance from 2011, 2012 and 2013 compared with the value of variance from 2010 is statistically significant.

A similar analysis was also conducted for ROA. The results are presented in Table 6.

Table 6. Comparison between ROA values computed using RAS and IFRS approach.

Element/Year	2010	2011	2012	2013
Mean Values	0.0210	0.0327	0.0168	0.0361
p value- for 2010 values		0.6301	0.8789	0.5425
p value- for 2011 values			0.5196	0.8773
p value- for 2012 values				0.4431
Median Values	0.0232	0.0364	0.0181	0.0375
Wilcoxon for 2010 values		0.6923	0.7774	0.5847
Wilcoxon for 2011 values			0.6376	0.8951
Wilcoxon for 2012 values				0.4624
Variance Values	0.0750	0.0602	0.0760	0.0438
Levene Test for 2010 value		0.5719	0.9964	0.5292
Levene Test for 2011 value			0.5757	0.9102
Levene Test for 2012 value				0.5329

From Table 6 it can be seen that there is no statistically significant difference in the value of mean, median and variance of ROA. It has to be mentioned that there was a difference in the way the two financial indicators were computed, as the ROE was the ratio between results and initial resources, while ROA was the ratio between results and year end value of total assets.

In general, shareholders are more interested in the value of ROE than in the value of ROA as it measures the benefits that they receive according to the risk associated with their investment. The results suggest that there was a change in the way companies reported their financial measures as the implementation of IFRS standards approached, but this change is significant only for the ROE ratio (the same results were obtained in the literature for ROE [63,65]) Consequently, our first hypothesis of research is valid only for return on equity, or in other words, it is reliable if the financial indicators are measured by dividing the results to initial resources. We consider that the result is in accordance with the regulation of Romanian National Securities Commission no. 116/2011 [67] which states that several societies such as investment societies, asset management companies, central depositories, market operators, collective investment societies have to provide a second set of financial measures for 2011 and 2012 using IFRS accounting regime. The entities that were listed on BSE could also construct their financial statements using the international framework standards, but in general these were used by other users and not by public institutions. After the adoption of the new regulation, companies provided financial data in terms of comparison under IFRS, but for some of them, only one year before the adoption was mandatory.

4.3. The Impact of Increasing Environmental and Social Protection on Accounting Financial Performance Indicators

The second part of the analysis consists of conducting panel data models in order to reveal if there is any influence of environmental and social indicators on the measures of financial performance. Table 7 presents the results according to the correlation matrix. It can be seen that there is a strong correlation between the company's size and the auditor type (0.6063) as the companies that are part of BIG 4 request higher audit fees in order to conduct the audit activity. This is due to the fact that it is

considered that they provide a higher level of confidence for the audited data [68,69]. Another correlation that can be identified is the correlation between air dummy variable (ADV) and water dummy variable (WDV) of 0.7207, waste dummy variable (WSDV) of 0.5412 and soil dummy variable (SDV) of 0.5524. We think that these positive relationships are due to the fact that when one company applies an environmental protection policy, it takes into account not only a single environmental factor, but rather a set of factors. There are other significant higher correlations, such as the correlation between water dummy variable (WDV) and waste dummy variable (WSDV) of 0.5195 and the correlation with soil dummy variable (SDV) of 0.5085 or the correlation between soil dummy variable (SDV) and sound dummy variable (SDDV) of 0.5416. It can be concluded, based on the correlation matrix, that positive correlations are detected between environmental qualitative variables. The exception is the correlation between the size of the company and the auditor type. An important correlation can be detected between the achievements on waste management (WSDV) and the production industry field (PIDV). While the correlation is positive, being 0.471, a negative effect was observed on the companies that belong to the service industry. As the variables that provide evidence on industry are complementary, the effect found in the production industry is opposite to the effect found in the service industry. A negative correlation (−0.409) was also detected between the production industries and the age of the company.

Table 7. Correlation matrix of the variables included in the analysis.

Element	ROE	ROA	Size	Liquidity	Debt	IFRSDV	AudDV	R&DDV	ADV	WDV	WSDV	EDV	GDV	SDV	SDDV	NDV	TDV	BRDV	AGE	RTN	PIDV	SIDV
ROE	1																					
ROA	**0.259****	1																				
Size	**0.291****	**0.347*****	1																			
Liquidity	−0.093	0.013	−0.188	1																		
Debt	−0.017	−0.190	−0.084	**−0.297****	1																	
IFRSDV	−0.124	0.044	0.006	−0.073	0.088	1																
AudDV	−0.121	−0.006	**0.606*****	−0.111	0.087	0.028	1															
R&DDV	−0.178	−0.188	−0.095	−0.203	0.017	0.081	−0.051	1														
ADV	−0.123	0.035	0.103	**−0.296****	−0.07	−0.006	0.1885	0.188	1													
WDV	−0.132	0.143	0.013	**−0.293****	0.001	−0.093	0.101	0.184	**0.720***	1												
WSDV	−0.131	0.016	0.113	**−0.267****	**0.241***	-0.002	**0.256****	**0.239***	**0.548*****	**0.519*****	1											
EDV	-0.043	**0.230***	**0.247***	-0.036	0.001	0.038	0.112	**0.241***	−0.016	**0.257****	0.092	1										
GDV	−0.023	**0.243***	**0.279****	0.0840	−0.149	−0.111	0.164	−0.048	0.178	0.202	0.150	**0.280****	1									
SDV	−0.089	0.029	0.005	−0.171	−0.050	−0.093	0.182	−0.018	**0.552***	**0.508*****	0.091	−0.091	**0.401*****	1								
SDDV	−0.050	0.175	−0.086	−0.080	0.035	−0.059	0.116	0.078	**0.395*****	**0.323***	**0.277*****	−0.058	0.192	**0.541***	1							
NDV	−0.078	0.022	−0.055	−0.133	**0.237***	−0.019	−0.087	0.104	0.004	0.154	−0.043	0.024	−0.018	−0.006	−0.141	1						
TDV	−0.133	0.210	**0.325*****	**−0.357*****	0.104	−0.054	**0.272****	0.129	**0.377*****	**0.316****	**0.234***	−0.021	0.164	**0.376*****	0.194	0.152	1					
BRDV	−0.053	0.117	0.105	0.0339	0.078	0.028	0.116	**0.348*****	**0.306****	0.147	**0.452***	0.042	0.192	0.166	**0.284****	−0.050	**0.283****	1				
AGE	−0.093	**0.531*****	−0.184	**0.286****	**−0.272****	0.071	−0.086	**−0.282****	−0.180	−0.069	−0.197	−0.083	0.139	−0.066	**0.274****	−0.010	−0.130	−0.127	1			
RTN	−0.073	**−0.251****	−0.035	0.034	−0.107	**0.218***	−0.011	0.128	−0.054	−0.074	−0.072	−0.013	−0.081	−0.054	0.106	−0.153	−0.108	−0.061	0.008	1		
PIDV	0.062	−0.121	**0.252****	−0.194	0.003	−0.021	0.160	**0.522*****	**0.295****	**0.266****	**0.471*****	**0.252****	0.079	0.040	0.104	−0.009	**0.243***	**0.29****	**−0.409*****	0.142	1	
SIDV	−0.062	0.121	**−0.252****	0.194	−0.003	0.021	−0.160	**−0.52*****	**−0.29****	**−0.26****	**−0.47*****	**−0.25****	−0.079	−0.040	−0.104	0.009	**−0.243***	**−0.29****	**0.409*****	−0.142	**−1*****	1

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%. The bold sign denotes where the correlation is significant, while the red bold text reveals where the correlation is significant and higher than 0.5.

In order to choose which variable among size and auditor type offers better results, we estimated both models and we picked the model that had both the value of Akaine and the average value of coefficients weighted by inverse of Akaike value as minimum. The results show that the auditor type is a better estimator than the size of the company. For example, when we use cross sectional fixed effect models, including size variable, the average of the coefficients of air dummy variable is 1.3450, while the inverse value of Akaike is 0.3627, which means criterion value is 0.4878. When the auditor variable is included, instead of the size of the company, the average of the coefficients is −0.3387, the inverse value of Akaike is 0.3789 which means criterion value is −0.1283.

Table 8 presents the results obtained by modeling the ROE as a financial indicator on several independent variables. The technique that we used is cross sectional fixed effects as we considered that the time influence could be revealed by IFRS dummy variable. Moreover, between 2010 and 2013, Romania had minor changes in the macroeconomic environment.

From Table 8, several conclusions can be extracted. First of all, there seems to be a negative correlation between the auditor type and the financial performance. We interpret this as a proof that companies that are audited by an entity part of BIG 4 less manipulate their financial performance, or in other words: any evidence about unreliable financial information would be revealed by the financial auditor (higher credibility of financial audit report) [52,68].

Another negative correlation is detected between ROE and the activity done in the research and development department. We consider that an increase in the research and development activities, does impact the financial performance year end measure because of the fact that the expenses related with research and development suffer an increase. The results could be similar with the ones found in the literature as there is evidence that R&D with the CSP and with the financial performance are strongly positively correlated in the long run [9]. On the other hand, we found on opposite conclusion as there seems that R&D activity should improve the profits of the company [70]. Regarding our results, the companies that we included in our analysis, have to make huge investment in order to obtain profitability, thus, a negative relationship could be reliable. The negative relationship has also been found on recent studies [48,71].

From the economic point of view, a mitigation of the air, of the water or of the soil pollution will impact the current ROE in a negative way. This aspect is better to be known by the investors as their annual return will decrease in the year where these changes occurred.

As it can be seen from Table 1, our companies have an activity where long term profitability is expected by the investors, rather than short term profitability. The profitability is obtained by using additional investment power. In accordance with this, the results on financial performance can be disseminated. It can be seen that the improvements done in increasing water, air and soil protection or in avoiding the pollution of them have a negative impact considering the contemporaneous approach. The results are in opposition with the one found in the literature where an improvement in avoiding pollution influences the profitability in a positive direction [27,64].

Table 8. Cross sectional fixed effect using ROE as dependent variable.

Dependent variable ROE-cross fixed effect																
Constant	**Liquidity**	**Debt**	**IFRSDV**	**AudDV**	**R&DDV**	**ADV**	**WDV**	**WSDV**	**EDV**	**GDV**	**SDV**	**SDDV**	**NDV**	**TDV**	**BRDV**	**Hausman test-*p* value**
1.8117 + α_i***	−0.0600	0.007	−0.0648	−1.2316**	−0.985***	−0.5214*										0.1200
1.8960 + α_i***	−0.0660	0.0908	−0.1601	−1.3398**	−0.8888**		−0.581*									0.1060
1.6834 + α_i***	−0.0461	0.0219	−0.0608	−1.4126**	−1.026***			−0.1129								0.1350
1.4780 + α_i***	−0.008	0.242	−0.0629	−1.2863**	−0.8030**				−0.6538							0.0369**
1.8065 + α_i***	−0.0420	−0.0128	−0.1016	−1.5279**	−1.0641**					−0.5377						0.0519*
1.8975 + α_i***	−0.0657	−0.0045	−0.1182	−1.3136**	−1.0722**						−0.5504*					0.1108
1.6790 + α_i***	−0.0445	−0.0109	−0.032	−1.478***	−1.076***							0.2890				0.1369
1.6714 + α_i***	−0.0451	0.0285	−0.0727	−1.440***	−1.020***								−0.1072			0.1777
2.1431 + α_i***	−0.0831	0.2164	−0.1795	−1.483***	−0.8019									−0.974***		0.0229***
1.6696 + α_i***	−0.0477	0.0554	−0.0546	−1.435***	−1.0372*										−0.2777	0.1954

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%. Each line denotes a specific panel data model analysis. Each model has two variables that are not dummies and four dummy variables. The auditor variable was included into the analysis as it provides lower value for Akaike and lower value for the average value of the coefficients weighted by inverse value of Akaike in comparison with the value found by using the size variable.

Both positive and negative relationships between greenhouse gases and financial performance were found in the literature, for dirty and clean industries, but the value of the correlation did not have a statistically significant difference from zero [48]. Thus, the second hypothesis can be reformulated: Any improvement in the environmental indicators influences the financial performance negatively. The hypothesis is valid considering the mitigation of air, water and soil pollution. Considering the social indicators, the model where training is used is better estimated using random effects. That means the unobserved variables are not correlated with any of the observed variables. Actually, from the economic point of view, this method is not recommended as some variables could be time invariant (companies could have trainings implemented annually). Regarding the training component, it can be acknowledged that they improve employees' performance and could increase their productivity, but the effect is expected to be observed in the long run [72]. We believe that negative correlation of training with financial performance will contribute to future value creation.

The models that we constructed are in general statistically significant, they do not present autocorrelation effect, but the test conducted on each equation proved that there is unobserved heterogeneity. Because of the small dimension of the sample the changing of this effect was not possible. The conclusion is that the third hypothesis is not confirmed. A similar analysis was conducted for the second metrics of the accounting financial performance. The results are presented in Table 9.

From Table 9 it can be seen that no environmental indicator influences the financial performance indicator (ROA). It can be concluded that implementing an environmental policy will have no effect on indicators measured by dividing the result to the year-end value of an element. The results are contrary to the ones found in the literature (there is evidence that greenhouse gases are negatively correlated with ROA for clean industries, and positive, but not statistically significant for dirty industries [48]). There is also evidence that reducing waste pollution improves future ROA [71]. Consequently, the second hypothesis is not valid as either positive or negative influence was detected.

It seems that giving benefits after retirement (variable that could be time invariant) would influence the financial performance measured by ROA. It is true that in the short run, a negative effect is presented as there is the additional cost of creating the benefits after retirement, but due to these benefits the entity can attract better trained people which could create value for it [72]. As a result, the third hypothesis is not valid; the social indicators do not influence in a positive way the financial performance in the short run.

From the economic point of view, we can observe both a positive and a negative influence of the environmental and of the social indicators on ROA. Based on this, it is possible that no effect to be identified when the combine effect of both the companies that belong to production and to service industries is included into the analysis

Considering both analyses where the accounting financial measures are encountered, we can observe that the liquidity ratio is not important as there is less evidence of its impact under IFRS [69], while debt seems to have a positive influence on ROA.

Table 9. Cross sectional fixed effect using ROA as dependent variable.

Dependent variable ROA-cross fixed effect															
Constant	**Liquidity**	**Debt**	**IFRSDV**	**AudDV**	**R&DDV**	**ADV**	**WDV**	**WSDV**	**EDV**	**GDV**	**SDV**	**SDDV**	**NDV**	**TDV**	**BRDV**	**Hausman test-*p* value**
$0.0090 + \alpha_i$	0.0011	0.013*	−0.0023	0.0135	0.0005	−0.0126										0.5513
$0.0038 + \alpha_i$	0.0021	0.013*	−0.0016	0.0007	0.0034		0.0044									0.6111
$0.0049 + \alpha_i$	0.0020	0.0141*	−0.0024	0.0008	0.0004			0.0025								0.5252
$0.0051 + \alpha_i$	0.0021	0.0142*	−0.0023	0.0009	0.0005				−0.0023							0.3429
$0.0118 + \alpha_i$	0.0022	0.0135*	−0.0028	0.0005	0.0004					−0.0147						0.0153**
$0.0095 + \alpha_i$	0.0017	0.0138*	−0.0032	0.0105	−0.009						−0.0009					0.5860
$0.0056 + \alpha_i$	0.0020	0.0137*	−0.0018	0.0079	0.0039							0.0004				0.5483
$0.0045 + \alpha_i$	0.0019	0.0136*	−0.0019	0.0089	0.0037								0.0056			0.5205
$0.0088 + \alpha_i$	0.0017	0.0154*	−0.0030	0.0083	0.0060									−0.006		0.3970
$0.0104 + \alpha_i$	0.0017	0.0231**	0.0001	0.0083	0.0043										−0.0660**	0.0551***

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%. Each line denotes a specific panel data model analysis. Each model has two variables that are not dummies and four dummy variables. The auditor variable was included into the analysis as it provides lower value for Akaike and lower value for the average value of the coefficients weighted by inverse value of Akaike in comparison with the value found by using the size variable.

4.4. The Impact of Increasing the Social and Environmental Factors on the Stock Market Returns

The last part of the study focuses on presenting the impact that social and environmental policies could have on stock market returns. Similarly with the previous analysis, we have tested the contemporaneous effect between the FP and the CSP or the FP and the environmental indicators. In order to reveal if the effect on stock market returns is similar with the effect found on ROE and ROA, we conducted the analysis by also presenting the correlations between variables. The results are presented in Table 7.

As it was mention, we firstly tested on the impact of environmental and social changes on stock market returns. We reproduced initial models (the models that we used when ROE and ROA are considered as dependent variables), but none of them was relevant considering the environmental or social improvements. After that, we split the data into two: one part focuses on production industries and the other represent the service industries. We decide to perform a subsample analysis because of the fact that industry variables are time invariant variables. Consequently, the effect of variables that do not vary over time cannot be estimated using the cross sectional analysis. This is because they use only the within variance of the estimators, excluding the between variance of them [73,74]. As automatic dummy variables are computed for each group, the multi-collinearity phenomenon is detected. In this case, the effects could be similar or not across groups, but we do not have any evidence of them.

In order to conduct the subsample analysis, we compute the correlation matrix between variables. Table 10 presents the correlation found on production industry field and Table 11 presents the correlation matrix found on service industry field.

Table 10. Correlation matrix for the production industry firms.

Element	ROE	ROA	Size	Liquidity	Debt	IFRSDV	AudDV	R&DDV	ADV	WDV	WSDV	EDV	GDV	SDV	SDDV	NDV	TDV	BRDV	AGE	RTN
ROE	1																			
ROA	**0.282***	1																		
Size	**0.311****	**0.388*****	1																	
Liquidity	−0.117	0.021	0.040	1																
Debt	−0.059	**−0.273***	−0.138	**−0.266***	1															
IFRSDV	−0.151	0.028	−0.043	−0.144	0.227	1														
AudDV	−0.172	−0.141	**0.513*****	−0.064	**0.359****	0.002	1													
R&DDV	**−0.313****	−0.239	−0.418***	−0.123	0.109	0.146	**−0.258***	1												
ADV	−0.180	0.053	−0.047	**−0.373****	0.059	0.098	0.086	0.127	1											
WDV	−0.190	0.205	−0.151	**−0.296***	0.229	0.060	0.034	0.085	**0.676*****	1										
WSDV	−0.219	0.050	−0.092	−0.233	**0.253***	0.015	**0.272***	−0.008	**0.631*****	**0.652*****	1									
EDV	−0.065	**0.297****	0.159	−0.056	0.009	0.081	0.015	0.246	−0.147	0.245	−0.090	1								
GDV	−0.036	0.228	0.207	**0.364****	−0.175	−0.042	0.042	−0.088	0.128	0.200	0.051	0.212	1							
SDV	−0.113	0.023	−0.063	−0.103	0.182	−0.015	0.207	0.008	0.530***	**0.443*****	0.214	−0.113	**0.473*****	1						
SDDV	−0.062	0.188	−0.199	−0.024	0.099	0.021	−0.021	−0.053	**0.410*****	**0.356****	**0.339****	−0.090	0.117	**0.531*****	1					
NDV	−0.091	0.069	−0.079	0.038	0.055	−0.111	−0.081	0.246	−0.051	0.145	−0.090	0.090	0.080	−0.011	−0.090	1				
TDV	−0.190	**0.258***	0.236	−0.179	0.233	0.015	**0.368****	−0.008	**0.340****	0.154	0.191	−0.191	0.182	**0.517*****	**0.339****	0.113	1			
BRDV	−0.063	0.199	−0.010	0.183	0.104	0.079	0.033	**0.257***	**0.328****	0.149	**0.364****	−0.008	0.242	0.230	**0.345****	−0.008	0.246	1		
AGE	−0.203	0.072	0.010	−0.153	0.249	**0.875*****	0.102	0.227	0.185	0.085	0.064	0.021	−0.083	−0.021	0.053	0.021	0.107	0.176	1	
RTN	−0.085	**−0.269***	−0.080	−0.097	−0.070	**0.292***	−0.082	0.089	−0.108	−0.131	−0.150	−0.036	−0.101	−0.067	0.103	−0.171	−0.169	−0.106	0.226	1

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%. The bold sign denotes where the correlation is significant, while the red bold text reveals where the correlation is significant and higher than 0.5.

From Table 10, it can be seen, that the highest correlation is between the age of the company and the new accounting regime. This could be due to the fact that older the entity is, higher the impact of IFRS is going to be as there are more adjustments to be made.

Table 11. Correlation matrix for the service industry firms.

Element	ROE	ROA	Size	Liquidity	Debt	IFRSDV	AudDV	R&DDV	ADV	WDV	WSDV	EDV	GDV	SDV	SDDV	NDV	TDV	AGE	RTN
ROE	1																		
ROA	**0.59*** **	1																	
Size	**0.456****	**0.697*** **	1																
Liquidity	−0.245	0.006	**−0.442***	1															
Debt	**0.501****	−0.215	−0.086	−0.374	1														
IFRSDV	−0.349	−0.114	0.059	−0.067	−0.0876	1													
AudDV	0.331	**0.752*** **	**0.784*** **	−0.121	−0.319	0.105	1												
R&DDV	−0.078	0.118	0.047	−0.167	−0.061	0.115	0.061	1											
ADV	−0.171	−0.061	0.151	−0.206	−0.261	−0.115	0.303	−0.067	1										
WDV	−0.288	−0.136	0.129	−0.280	−0.340	−0.314	0.121	0.061	**0.786*** **	1									
WSDV	0.181	0.029	0.173	−0.272	**0.407***	0.140	−0.015	0.081	0.081	−0.015	1								
EDV	0.044	0.047	0.271	0.112	−0.137	0.000	0.105	−0.192	0.192	0.105	0.327	1							
GDV	**0.466****	**0.562***	**0.573*** **	−0.188	−0.121	−0.333	0.454	−0.192	0.192	0.105	0.327	**0.444****	1						
SDV	−0.316	−0.168	0.120	−0.276	−0.328	−0.218	0.206	−0.126	0.630	**0.663*** **	−0.275	−0.218	0.145	1					
SDDV	0.162	0.337	0.320	−0.103	−0.160	−0.333	**0.454****	0.192	0.192	0.105	−0.140	−0.111	**0.444****	**0.509****	1				
NDV	0.263	−0.074	0.126	−0.301	**0.476****	0.105	−0.099	−0.182	0.061	0.121	−0.015	−0.245	−0.245	−0.023	−0.245	1			
TDV	0.036	0.106	**0.403***	**−0.497****	−0.032	−0.204	0.043	0.000	0.236	**0.47****	−0.057	0.068	0.068	0.134	−0.272	0.257	1		
AGE	−0.350	−0.060	0.071	−0.023	−0.074	**0.894*** **	0.141	0.052	−0.155	−0.328	0.063	0.000	−0.298	−0.098	−0.149	0.047	−0.274	1	
RTN	−0.103	0.147	−0.036	**0.495****	−0.308	−0.048	0.199	−0.037	−0.083	−0.083	−0.242	−0.170	−0.068	−0.040	0.040	−0.109	−0.094	0.009	1

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%. The bold sign denotes where the correlation is significant, while the red bold text reveals where the correlation is significant and higher than 0.5.

From Table 11 it can be concluded that the highest correlations found in the initial sample could be due to the correlations that exist between companies that belong to the service industry. Size is highly correlated with ROE and ROA and with the auditor type. The same correlation is encountered between age and the accounting regime. Other correlations are between different dummy variable.

Table 12 presents the influence of social and environmental variables on ROE, based on industry specification.

Table 12. The influence of social and environmental variables on ROE—industry specification.

Dependent variable ROE-cross fixed effect-production industries															
Constant	**Size**	**Debt**	**Age**	**R&DDV**	**ADV**	**WDV**	**WSDV**	**EDV**	**GDV**	**SDV**	**SDDV**	**NDV**	**TDV**	**BRDV**	**Hausman t**
−67.4820 + α_i	−0.4496	−0.0024	0.0367	−2.1076***	−0.7586 (p = 0.1094)										0.0242***
79.2672 + α_i	0.2386	0.1419	−0.0394	−2.0606***		−0.5778 (p = 0.1644)									1.0000
43.0288 + α_i	−0.4328	0.0906	−0.0118	−2.2953***			−0.3173								0.0955*
122.9370 + α_i	−1.7759	0.0456	−0.0522	−1.6949*				−0.6517							1.0000
57.1017 + α_i	−1.0866	0.0598	−0.0222	−2.2603**					−0.3089						0.0800*
44.6512 + α_i	−0.3373	0.0222	−0.0195	−2.3363***						−0.8354*					1.0000
49.1618 + α_i	0.3736	0.0542	−0.0251	−2.4042***							0.4259				0.0638***
0.9115 + α_i	−0.6909	0.0301	0.0037	−2.5432***								0.2663			1.0000
116.5041 + α_i	3.1767	0.3708	−0.0711	−1.9004***									−1.4415*		0.0274**
27.9940 + α_i	−0.5516	0.0793	−0.0104	−2.3414***										−0.1583	1.0000
Dependent variable ROE—cross fixed effect—services industries															
29.4495 + α_i*		−0.0170**	0.0131	−0.0238	−0.0046										1.0000
37.8423 + α_i**		−0.0187**	0.0135	−0.0220		−0.0145									1.0000
36.6437 + α_i**		−0.0181**	−0.0234	−0.0257 (p = 0.1148)			−0.0476*								1.0000
33.9408 + α_i**		−0.0168**	0.0123	−0.0227				0.0109							1.0000
34.8521 + α_i**		−0.0172**	0.0115	−0.0245					−0.0005						1.0000
34.4915 + α_i**		−0.0171**	0.0115	−0.0241						−0.0006					1.0000
33.7117 + α_i**		−0.0167**	0.0131	−0.0236							0.0012				1.0000
34.4681 + α_i**		−0.0171**	0.0098	−0.0225								0.0046			1.0000
36.4715 + α_i**		−0.0181**	0.0416	−0.0147									−0.0250		1.0000

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%.

Table 12 presents the influence of social and environmental variables on ROE, considering the industry's specification. It can be observed that a statistically significant negative relationship is encountered between soil protection or trainings and financial performance, measured through ROE when the companies are in the production industries. A significant effect is also detected for avoiding air and water pollution. As the sample size is quite small, we admit that these coefficients are statistically significant from zero, considering a risk around 16.44% of rejecting the null hypothesis of *t* test.

Other elements that can be observed in Table 12 are related with the fact that in case we analyze the companies that act on production industries, there is a negative significant relationship between financial performance, measured though ROE, and the existence of research and development activity. It has to be acknowledged that additional analysis had been conducted by excluding the Research and development variable. The results prove that air (−1.0125 *), water (−0.8695 *), energy (−1.4373 ***) and training variables (−1.8181 ***) are negatively related with the dependent variable. It can be concluded that for production companies the existence of research and development activity does not influence in a significant way the impact of environmental and social elements on financial performance.

In the analysis conducted on companies that act on service industry, several variables such as the accounting measure and the auditor type were not included because of high correlation. In fact, the model where the gas pollution is tested could be biased (high correlation exists between gas variable and ROE—see Table 11). There is also another variable on which no estimations were done as these companies do not offer benefits after retirement.

Regarding the service industries, relevance of the model was found only when waste protection is encountered. In this case, the research and development variable is statistically significant from zero if we accept a risk of 11.48% of rejecting the null hypothesis of *t* test. Considering that we decided to admit a risk of 16.44%, this relationship is valid. Additional analysis (by excluding R&DDV) proved that the influence of waste on ROE remains significant (−0.0450 *). The training component could have a negative impact on financial performance (value = −0.0827, $p = 0.1293$).

By comparison, sub-sample results with the results found on the whole sample, it can be concluded that the results found on production industries influence the results found on the whole sample. Related to the literature, the results are mixt. For clean industries, a negative effect was also detected between greenhouse gases and ROE and a negative influence between waste management and ROE, which is statistically significant [48]. Our results are opposite as we have identified significant negative correlations even at sub-sample analysis.

From the economic point of view, the influence of the environmental and the social changes (even if they are very mixed)—as improvements—impacts the financial performance, measured by ROE, in a negative way (even it is not statistically significant) either if the companies belong to the production or to the services industries. Even though it is not statistically significant, a positive influence seems to exist between ROE and the adoption of a new standard or the improvements done in reducing sound pollution for both industries.

The second accounting measure is the return on assets- ROA. Same analysis has been conducted for the companies that belong to the production or service industry. The results are presented in Table 13.

Table 13. The influence of social and environmental variables on ROA—industry specification.

Dependent variable ROA-cross fixed effect-production industries															
Constant	**Size**	**Liquidity**	**Age**	**R&DDV**	**ADV**	**WDV**	**WSDV**	**EDV**	**GDV**	**SDV**	**SDDV**	**NDV**	**TDV**	**BRDV**	**Hausman t.**
−20.5684 + α_i*	−0.0088	0.0103*	0.0106*	−0.0040	−0.0223 (p = 0.1734)										1.0000
−18.6227 + α_i*	−0.0111	0.0110*	0.0097*	−0.0147		0.0077									1.0000
−18.3646 + α_i*	−0.1068	0.0110*	0.0096*	−0.0118			0.0006								1.0000
−18.6610 + α_i	−0.1075	0.0110*	0.0097*	−0.0115				0.0001							1.0000
−18.7800 + α_i*	−0.1406	0.0136**	0.0094*	−0.0065					−0.0292*						1.0000
−18.4478 + α_i*	−0.0974	0.0113*	0.0096*	−0.0117						−0.0174					0.8671
−18.4472 + α_i*	−0.0915	0.0109*	0.0095*	−0.0126							0.0066				0.9109
−18.9701 + α_i*	−0.1019	0.01029 (p = 0.1029)	0.0098*	−0.0172								0.008			1.0000
−18.7026 + α_i*	−0.105	0.0110*	0.0097*	−0.0108									−0.0022		0.8433
−21.6677 + α_i*	−0.1182	0.011*	0.0113*	−0.014										−0.0198	0.6116
3.4521 + α_i**		0.0003	−0.0016	−0.0039	−0.0033										1.0000
3.5476 + α_i**		0.0003	−0.0017	−0.0034		−0.0017									1.0000
2.8980 + α_i**		0.0005	−0.0014	−0.0030			−0.0041								1.0000
3.0227 + α_i**		0.0006	−0.0014	−0.0033				−0.0050							1.0000
3.0649 + α_i**		0.0004	−0.0015	−0.0034					-8×10^{-15}						1.0000
3.0238 + α_i**		0.0005	−0.0014	−0.0033						0.00003					1.0000
2.8593 + α_i**		0.0004	−0.0014	−0.0035							0.0022				1.0000
3.0174 + α_i**		0.0004	−0.0014	−0.0036								−0.0006			1.0000
2.2227 + α_i**		0.0006	−0.0010	−0.0003									0.0032		1.0000

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%.

Table 13 reports the industry effect of avoiding pollution and of corporate social indicators on financial performance which is measured by return on assets. Even though we have controlled for firm size and age in the initial model, only one variable seems to be statistically significant for production companies. The impact of gas emission does affect the ROA in a negative way. This means that considering contemporaneous effect, a mitigation of gas emission does affect the financial performance in a negative way. If we perform additional analysis by excluding the research and development component, we observed that the results are almost the same. The relationship between gas emission and financial performance remains unchanged (−0.0297 *), while the relationship between air and financial performance improves a little bit in terms of significance (value = −0.0228, $p = 0.1472$). Considering the small sample dimension and the smallest dimensions of sub-samples we accepted a probability of about 17.34% for rejecting the null hypothesis according to which the coefficient of air variable is not statistically significant from zero. Thus, a negative relationship between ROA and avoidance of air pollution is detected.

By comparison of sub-sample results with the one found on the whole sample, we observed that improvement in the gas emission impact the financial performance in a negative way. The results are mixt to previous literature. There are studies where a negative effect is found between environmental improvements and financial performance [48], while other studies report negative relationship considering a one year lagged analysis, and a positive relationship considering two years lagged analysis [75].

From the economic point of view, even though the coefficients are not statistically significant from zero, it can be concluded that there is a different effect of the environmental and the social indicators on the financial performance when we look at industry specification. For the companies that belong to the production industry, we could have a rather positive and not a negative effect of the environmental changes on ROA. The exception is encountered when the improvements in avoiding the air pollution and the soil pollution are analyzed. A negative influence is also found between the social indicators and ROA.

For the companies that belong to service industry, a negative relationship between ROA and the avoidance of pollution in several environmental indicators can be observed. On the other hand, a positive influence seems to exist between the avoidance of the sound and the soil pollution and ROA. We can also observe that the adoption of a new standard impacts the financial performance in a negative way, while the existing of training and inside courses influences ROA in a positive manner. In order to shed the robustness of the results, we conducted the same analysis using the stock market return as a dependent variable. The results are shown in Table 14.

Table 14. The influence of social and environmental variables on stock market returns—industry specification.

Dependent variable stock market return fixed effect-production industries																
Constant	Size	Debt	Liquidity	Age	R&DDV	ADV	WDV	WSDV	EDV	GDV	SDV	SDDV	NDV	TDV	BRDV	Hausman t.
$143.5992 + \alpha_i$	0.6669	0.0983	0.519***	−0.0739	0.7730*	−0.1300										0.0003***
$157.6174 + \alpha_i$	0.5799	0.1037	−0.506***	−0.0805	0.7194*		0.0286									1.0000
$159.2528 + \alpha_i$	0.5600	0.0968	−0.506***	−0.0812	0.7216*			0.1128								0.0001***
$117.0267 + \alpha_i$	1.8138	0.1314	−0.539***	−0.0657	0.2083				0.5698 (p = 0.1104)							1.0000
$171.6643 + \alpha_i$	1.2747	0.1492	−0.538***	−0.0906	0.6924*					0.3142						0.0000***
$161.9724 + \alpha_i$	0.5899	0.1159	−0.510***	−0.0827	0.7373*						0.1539					0.0002***
$167.0321 + \alpha_i$	1.3078	0.1052	−0.510***	−0.0884	0.6823*							0.2901				1.0000
$168.3905 + \alpha_i$	0.6084	0.1166	−0.495***	−0.0860	0.8123*								−0.1072			1.0000
$201.2255 + \alpha_i$	1.8895	0.2100	−0.530***	−0.1080	0.8811**									−0.4385 (p = 0.1752)		1.0000
$109.9953 + \alpha_i$	0.8466	0.1808	−0.514***	−0.0579	0.6798*										−0.5727 (p = 0.1887)	1.0000
Dependent variable stock market exchange cross fixed effect-services industries																
$7.5877 + \alpha_i$	−0.8912		0.0359		−0.0352	−0.0453										0.8454
$6.8698 + \alpha_i$	−0.8133		0.0391		−0.0254		0.0361									0.8591
$6.6564 + \alpha_i$	−0.7852		0.0374		−0.0199			−0.085								0.8800
$4.7521 + \alpha_i$	−0.5695		0.0480		−0.0240				−0.3100							0.9511
$7.0877 + \alpha_i$	−0.8304		0.0347		−0.0744					−0.2636						0.7647
$6.5973 + \alpha_i$	−0.7875		0.0432		−0.0019						0.1249					0.8345
$7.1244 + \alpha_i$	−0.8399		0.0372*		−0.0261							−0.0193				0.8539
$8.8168 + \alpha_i$	−1.0427		0.0418		0.0180								0.1198			0.7970
$6.1181 + \alpha_i$	−0.7327		0.0425		−0.0319									0.1243		0.8411

Note: ***, **, * denotes statistically significant at 1%, 5%, 10%.

Table 14 provides evidence about the impact of the changes in environmental and social indicators on the stock market returns. As it can be seen, there is not a reliable relationship if we consider that the coefficients are statistically significant at 1%, 5% or 10%. On the other hand, based on the assumption that the dimension of the sample is reduced, we can accept a higher degree of risk for rejecting the null hypothesis of *t* test. If we assume a risk of 18.87% then several relationships can be detected between environmental changes and stock market returns (which is the measure for financial performance). These results are relevant for the companies that belong to production fields. An improvement in energy usage will generate an improvement in the financial performance considering a one year lag between FP and environmental indicators. Negative correlation is found between trainings and benefits after retirement and FP even though the relationship is not contemporaneous analyzed, rather is one lagged time looked at. Regarding the mixed impact that we have discovered, the results are similar with the results met in other research papers [75,76].

Another important relationship is the one detected between the existence of research and development activities and the stock market returns. It seems that there is a positive correlation between them considering the one lagged time approach.

Similar with previous additional tests, we have excluded the R&D variable and we have repeated the analysis. The improvement in energy usage for the companies that belong to production industries becomes statistically significant (0.6663 *) and influences the stock market return in a positive way. Improvements on FP, but not statistically significant at 10%, but rather at 14.84% are going to be detected by gas emissions (value = 0.3547, $p = 0.1484$). Actually even though they are not statistically significant, the relationship between environmental improvements and stock market returns seems to be positive for companies that belong to production industries. A negative relationship is going to be found between FP and the benefits that the employees receive after retirement (value= −0.6252, $p = 0.1484$).

From the economic point of view, for the companies that belong to the production industries, a positive correlation between the stock market returns and the environmental indicators is expected to be observed one year after the environmental changes occurred. The problem is that in several models, the random model seems to be more appropriate. In this case, the results could be biased.

For the companies that belong to the service industries, we expect to observe a decrease of the stock market returns one year after the environmental improvements occurred (the exception is revealed when the relationship between the stock market returns and the waste management or the gas pollution is analyzed). While the companies that belong to production industries report a negative influence of the adoption of a new standard or of the existence of the inside courses and trainings, the companies that belong to the service industry report a positive relationship for both variables.

Overall, our results tend to be negative when the relationship between financial performance and environmental and social changes in considered. We found a negative relationship considering contemporaneous approach between improvements in air, water, soil pollution and ROE. A significant negative relationship is detected between training of the employees and ROE. Considering the ROA, only the benefits impact it in the same year that they occurred.

According to the literature [77], the relationship between the financial performance and the social or environmental performance depends on the nature of the relationship between companies and

stakeholders. Moreover, the impact of bad CSP tends to be larger than the impact of positive CSP due to the asymmetry of information.

The contemporaneous effect was tested also on subsamples as we divided our sample into companies that belong to production and companies that belong to service industry. Same correlations with the ones found on the whole sample were detected between environmental indices and ROE for the companies that belong to production industry. A significant difference was detected for the companies that belong to service industry as the improvement on waste usage influences in a negative way the ROE (contemporaneous approach).

The results on ROA are significantly different for the one found on ROE. While on the whole sample, only the benefits after retirement influence in a negative way ROA, by conducting the analysis on sub-samples, it can be concluded that the gas emission have a negative influence on the return on assets for the companies that belong to production industries.

In order to shed the robustness of the results, additional analysis has been conducted on stock market returns and the change that occurred in environmental and corporate elements. This time the analysis was conducted considering a one year lagged relationship. While on the whole sample, there is no significance that a change in environmental elements will influence the stock market returns, there is evidence that improvements in the energy usage can positively affect the stock market returns. The influence of the benefits after retirement and the existence of trainings are still negative after a one year period of time from their appearance.

5. Conclusions

The present research tries to provide information about how the improvements in environmental and social protection influence the accounting financial performance measured by ROE and ROA considering contemporaneous approach. The study also tries to reveal if any improvement in environmental and social elements has an impact on stock markets returns considering a one year lagged analysis. The study is conducted on the Romanian listed companies into the Bucharest Stock of Exchange (BSE) in the first category. The analysis was conducted using a four year period of time (2010–2013) and the results were obtained by using a fixed effect panel data model. The interest in this topic is due to the fact that we think that the existence of other qualitative and quantitative variables such as improvements in environmental and social indicators or changes of the accounting measures can influence the financial performance either in a contemporaneous period or in one year lagged period of time. The data regarding the companies that are listed into the BSE was collected from their individual board of directors' reports, individual sites and BSE's site.

Because of the fact that a change in financial reporting can influence the financial performance, the first part of the analysis compared the difference between mean, median and variance of financial accounting indicators considering national and international accounting measures. The results proved that only the values of the variance of ROE from 2011, 2012 and 2013 compared with the value of the variance of ROE from 2010 were statistically significant. We think that this is due to the fact that, starting from 2011, several companies provided the financial statements both under the Romanian Regulation and under the IFRS. We interpret these results as being important as the new accounting framework is considered to ensure a higher degree of transparency.

The second part of the analysis tries to reveal the relationship between several environmental dummy variables, social dummy variables and accounting measures for financial performance. We constructed a panel data model and we included into the analysis additional variables both qualitative: such as the type of the financial auditor or the accounting regime- and quantitative variables such as liquidity, size, the company's age and debt.

The results are mixed and are similar with other results found in the literature [48,69]. There is a significant effect of increasing water, air and soil protection on financial performance measured by ROE, but the effect is negative. We consider that the explanation is due to the fact that Romanian companies on which the analysis was conducted belong to two types of industries: the production industry and the service industry. The results obtained on the whole sample are similar with the results found on sub sample analysis, mainly on the companies that belong to production industries. A negative influence was detected. The results could be related with the fact that higher expenses are encountered in the year where the protection of environmental elements arises, feature that impacts on the value of ROE or on the value of ROA.

Other environmental factors such as: the waste policy, the energy, gas, soil and sound pollution improvements have no influence on the financial performance measured by ROE. The results are found from a whole sample analysis. Moreover, no influence of environmental factors was detected on ROA. The results are contrary to the results found on Chinese Industry where environmental performance has a negative impact on ROA [17]. The results are also contrary to the results reported on the Japanese manufacturing industries: dirty and clean industries. For the clean industries, no statistically significant relationship between financial performance, measured by ROE and ROA was detected. For the dirty industries, a negative influence between ROA and greenhouse gases was detected [48]. Some evidence of subsample analysis (for companies that act on production) proved that there is a negative relationship between ROE and improvements in soil pollution and between ROA and gas emission, considering the contemporaneous effect.

Regarding the social dummy variables, their effect is also mixed as they could be variables that are time invariant. We have analyzed training of the employees and benefits after retirement. The results also show a negative correlation between trainings and ROE (a relationship that can also be found on companies that belong to production industries) and a negative correlation between benefits after retirement and ROA. We consider that these are more correlated with the value added component of the entity. The literature provides evidence that it is hard to establish the effectiveness of CSR. This is because the profit could be influence by qualitative variables such as the employees' morale, the image of the corporation, the goodwill, the reputation and the popular opinions [42,43]. In fact, the relationship between financial performance and corporate social performance can depend on stakeholder heterogeneity [77].

The last part of the research was based on an additional analysis, where the dependent variable was measured though stock market returns. While the first part of the analysis is looking to a contemporaneous effect, this analysis considers a lagged relationship between the FP and the environmental or social performance.

The results found are a little bit contradictory. While there is no evidence that a relationship between stock market returns and environmental or social variables exist, when the whole sample is analyzed, there seems to be a correlation at individual sample level. Thus, for the companies that

belong to production industries the improvement on energy usage seems to influence the stock returns in a positive way. Also, a negative relationship between the benefits after retirement and the training of the employees and financial performance, measured though stock market returns, seems to persist one year after those measures have been implemented.

Overall, our results tend to be negative or not statistically significant when the relationship between financial performance and environmental and social changes in considered. In general, a better environmental performance should bring benefits to a firm considering that environmental pollution is a sign of inefficiency [58,59]. One of the main problems that we encountered in conducting the analysis was the lack of data as only 18 companies (from which 2 are in insolvency procedure, without investment societies, banks and other similar organizations) are listed on BSE. They have to report both environmental indicators and their individual financial statements using IFRS. Even if we collect data for a four year time period, the size of the sample is still reduced. The number of observations is very limited when sub-sample results are analyzed due to the fact that we focus on two industries and we estimated the models on a short period of time. As a fact, the results could be biased, but this is the most that could be achieved with the data.

Another problem is that there is not a standardized manner of reporting the environmental or social indicators and sometimes the information can be ambiguous. The information is not in terms of available data that could be scaled though size or sales, but rather as text that was found on the board of director's report. We admit that the results could include firm disclosure, but we have found individual data only at country level. We admit that non-disclosing companies could also improve their performance, but because of the lack of data we were not able to conduct such an analysis.

There is also a limitation considering the unobserved heterogeneity from the data that we couldn't control for. The literature provides evidence that when this heterogeneity is controlled, by using the dynamic panel data analysis, no influence among financial performance and environmental variables can be identified [78].

We also consider that manual data collection could cause additional problems and could generate biased estimations.

Another problem that we can assume is that we look only for contemporaneous and one year lagged period of time effect between financial performance and social environmental changes. As the analysis is conducted on 2010–2013, we do not have the possibility to test the relationship between the FP and the CSP or the environmental performance in the long run. The only way of testing it is by reducing significantly the dimension of the sample due to the lack of data. Consequently, the entire analysis would be conducted on a smaller sample and could be biased. We believe that in the long run, the relationship could be positive as better environmental performance is a sign of efficiency [58,59,75,76].

On the other hand, we believe that the research is important both in terms of financial performance and environmental and social protection policies. The research contributes to the literature as it provides information about the behavior of Romanian entities that are listed into the Bucharest Stock Exchange. The research takes into account that the entities are more specialized in constructions, industry, oil and energy activities, pharmaceutical and real estate development, where investors expect to gain benefits after a long period of time.

From the economic point of view, the results are mixed in terms of shareholders' gains and in terms of statistically significance. If we do not take into account if the coefficients are or not statistically

significant due to the dimension of the sample, several conclusions can be pointed out. The ROE seems to be negative correlated with the changes in the social and in the environmental indicators (such as the air protection, the water protection and the soil pollution), either if the companies belong to the production, to the services industry or to the whole sample. This is better to be known by the investors as their annual return will decrease in the year where these changes occurred. A positive relationship exists between ROE and the adoption of a new standard for both industries.

Considering the financial performance measured by ROA, we are going to detect mixed results. For the whole sample, there is a possibility to have not an influence of the improvements in the social and the environmental indicators For the companies that belong to production industry there is a positive effect for almost all the environmental and the social variables, the exception being the improvements in avoiding the air pollution, the soil pollution and the impact of the social indicators. Contrary to these, for the companies that belong to service industry the negative effect prevails. Positive influence could be found between the avoidance of the sound pollution, the avoidance of the soil pollution or the existing of the trainings and ROA.

When we analyze the relationship between the stock market returns and the changes that occurred in the environmental or the social performance, we can also provide evidence of the mixed effect. As a fact, the stock market returns will increase one year after the changes occurred for the companies that belong to production industries for almost each environmental or social variable. The effect is opposite for the companies that belong to the service industries. Thus, the stock markets returns will decrease one year after the change occurred. A mixed relationship is also detected between the adoption of the new standards and the existing of the inside courses and trainings and the stock market returns. While for the first, a negative relationship is detected, for the second, a positive correlation should exists.

Overall, our paper provides evidence to the extant literate that the effect of corporate social behavior on financial performance could be negative considering the contemporaneous approach, and positive one year after the changes occurred.

Further analysis is going to establish a mixed effect linear panel data model, where the control for both fixed and random effects can be ensured and the heteroscedacity can be removed. We also aim to extend the analysis to the other entities that are listed on BSE and on providing a long term relationship between environmental performance and financial performance. We also aim to find other data though which the firm disclosure can be mitigated.

We consider that the results are reliable and offer several signs about what the interests of the companies after the economic crisis are. We state that sustainable development cannot be obtained using only financial measures and that the environmental and social protection policy should be properly integrated.

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Author Contributions

The authors' contributions to this research are equal in terms of knowledge, effort and implication. All authors contributed both at writing and conducting the analysis. Each one searched for relevant articles, the methodology, the database, the results and their interpretation being done by joint effort. The conclusions and the recommendations were developed after several discussions among the three researchers. All authors have read and approved the final manuscript.

Appendix

Industry	Company's Symbol	Company's Name	NACE code
Production industry	ALR	Alro S.A.	2442
	ATB	Antibiotice S.A.	2110
	BIO	Biofarm S.A.	2120
	ELMA	Electromagnetica Sa Bucuresti	2651
	PREH	Prefab Sa Bucuresti	2361
	TBM	Turbomecanica S.A.	3030
	TEL	C.N.T.E.E. Transelectrica	3512
	SNN	S.N. Nuclearelectrica S.A	3511
	SNP	Omv Petrom S.A.	0610
	SNG	S.N.G.N. Romgaz S.A	0620
	IMP	Impact Developer & Contractor S.A.	4110
Service industry	OIL	Oil Terminal S.A	5224
	TGN	S.N.T.G.N. Transgaz S.A	4950
	SOCP	Socep S.A	5224
	COTE	Conpet Sa Ploiesti	4950
	RPH	Ropharma Sa Brasov	4773

Conflicts of Interest

The authors declare no conflict of interest.

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