The Impact of Corporate Sustainability Performance on Firm Value
Can the ESG Performance Improve the Firm's Value?

Edina Éva Kulcsar

Partium Christian University, Faculty of Economics and Social Sciences, 410209 Strada Primăriei 27, Oradea, Romania, kulcsar.edina@partium.ro

Edit Veres

Partium Christian University, Faculty of Economics and Social Sciences, 410209 Strada Primăriei 27, Oradea, Romania, veresedit@partium.ro

Mónika Garai-Fodor

Obuda University, Keleti Károly Faculty of Business and Management; 1084 Budapest, Tavaszmezo 15-17
fodor.monika@kgk.uni-obuda.hu; ORCID: 1 0000-0001-7993-2780

Abstract: The responsibility of companies to reduce the harmful effects of climate change is evident. This research aims to investigate the impact of corporate sustainability performance on corporate fi-nancial performance and firms' value of 47 listed pharmaceutical companies. Corporate sustain-ability performance was expressed by Sustaianalitics's ESG Risk Ratings and their dimensions. The analysis of the relationship between sustainability and financial performance is based on the fi-nancial statements of listed pharmaceutical companies with the greatest market capitalization and available ESG risk rating between 2021-2022. The corporate financial performance has been ex-pressed in accounting measures by profitability ratios (ROA, ROE), and the firm's value was computed with Tobin's Q. The analysis was carried out with correlation analysis and linear re-gression using the R statistics system. Based on the coefficient of determination, there is a weak relationship between ESG dimensions and financial performance (OpROA) and strong relationship between ESG Risk ratings, capital structure, and investigated firms' performance.

Keywords: corporate financial performance; sustainability performance; green finance; ESG risk; climate change; correlation

1 Introduction

Climate change is one of the biggest environmental challenges of our time. The responsibility of companies to reduce the adverse effects of climate change is evident. According to the traditional approach, increasing the best possible performance at the corporate level is essential, which is the fundamental condition of maximization of corporate value.

Sustainable finance promotes an integrated approach, which, in addition to wealth growth, represents the interests of the "stakeholders" and the wider community. In the international literature, this is called the triple bottom line (TBL), which refers to people, planet, and profit. According to the concept of "Triple bottom line" besides the financial prosperity, the firm should consider the environmental and social aspects [1]. According to Sustainable Finance 3.0, value creation concerns long-term common good value creation. This also means an integrated approach to the main corporate goal of financial value maximization, which involves both environment and social aspects [2].

2 Literature Review

To reduce negative environmental effects, the first step may be identifying and measuring the environmental risk factors and then effectively managing these. These require environmental and social responsibility and compliance with the principle of economic efficiency. These aspects of corporate sustainability performance are expressed as ESG scores (ESG – Environmental, Social, and Governance). On the one hand, corporate sustainability performance appears mostly in qualitative forms through ESG or non-financial reports. On the other hand, they are expressed in a more concentrated form by ESG indicators, such as performance or risk measures. The ESG approach focuses on environmental, social, and corporate governance. Due to the Non-Financial Reporting Directive NFRD—Directive 2014/95/EU, large companies must disclose non-financial information on how they deal with the challenges of climate change and social issues. The literature analyses show that among the most frequently used non-financial reporting frameworks are GRI standards (Global Reporting Initiative) and the sustainable development goals of the SDGs (Sustainable Development Goals) formulated by the UN.

Several studies deal with the impact of sustainability performance reporting on financial performance [3]. Lehenchuk et al. examined the complex impact of sustainability reporting on improving the institutional environment for sustainability reporting in Turkish companies and the impact of sustainability reporting on financial performance across multiple sectors. [4]

Keskin and Dincer draw attention to the importance of improving the institutional environment for sustainability reporting in Turkish companies. It is worthwhile to put a strong emphasis on the right iteration, they suggest to improve the quality of sustainability reporting disclosure and to improve the monitoring system for the placement of sustainability reports. [5]

Rachmat et al. examined the relationship between disclosure of sustainability measures and the financial success of Indonesian companies. They found that increasing sustainability disclosure can improve a company's financial performance and can be a significant factor in investment decisions. [6]

Kashirskaya et al. [7] found in their research that sustainability-oriented development positively influences a company's financial performance.

Gillan et al. [8] conclude in their research that the ESG aspect may increase the corporate value in two ways: from higher corporate cash flow as a result of higher sales level and by maximizing shareholder utility as a result of owning a sustainable company. According to other approaches, a negative relationship exists between companies' sustainability performance, expressed by ESG, and financial performance. This can be explained by the fact that environmentally, socially responsible companies have additional costs, leading to a decrease in financial performance [9]. Wang et al. [10] conclude in their research that firm size and sustainability development are positively related to corporate sustainability performance. Abdi et al. [11] also investigated the relationship between ESG performance and financial performance and the firm's value of 38 airline companies. They conclude that the environmental and social initiatives may increase Tobin’s Q value. They also underline the significant moderating effect of firm size in their model examining the relationship between ESG and financial performance. They also underline the moderating role of firms’ size in ESG and financial analysis models. Some research confirms the positive association between firm size and disclosure of social aspects [12]. Garcia et al. [13] research underlines that environment-sensitive companies present superior environmental performance, maybe in order to protect their reputation. Fain's [14] research on the relationship between sustainability performance and financial performance shows mixed results. Its results show that while the environmental (E), social (S), and ESG scores do not significantly affect financial performance, the corporate management (Governance) aspect positively affects financial performance. According to other approaches, a negative relationship exists between companies' sustainability performance, expressed by ESG, and financial performance. This can be explained by the fact that environmentally, socially responsible companies have additional costs, leading to a decrease in financial performance [15].

According to other researchers (Gao – Han, 2020) [16] [17], compliance with sustainability criteria implies additional costs, which may reduce the performance in the short term, but the company may benefit from it in the long term.

Bodarenko et al. [18] research shows that the positive effect of non-financial reporting on corporate performance is quite different by sector. They found the positive influence of non-financial reporting on corporate performance in the case of industrial and utility sectors. Liu – Anbumozni [19] also summarize that non-financial reporting and ESG scoring are mostly typical for firms that are engaged in international activities. According to Krüger [20], negative ESG events may affect unfavorable the firm's financial performance. Despite the additional cost of sustainability initiatives in the short term, the positive impact on the firm's value is evident in the long term. Many studies deal with sustainability initiatives on a firm's value in some specific industries such as tourism, hospitality, airlines, hotels, and restaurants [21] [22].

According to McWilliams-Siegel [23], a completely neutral correlation between company financial performance and ESG aspects can be observed. Kondouri et al. [24] examined the top 50 European companies of STOXX Europe ESG Leaders 50 Index ESG performance, financial performance, capital structure and risk. They found out that companies with lower market risk levels, measured by beta, have better financial performance. They also conclude that firms with good ESG performance also have good financial performance. They found that firms' good ESG performance impacts the company's profitability, valuation, capital efficiency, and risk. Naeem and Çankaya [25] investigated the impact of ESG performance on financial performance and the value of energy and power generation companies. They found out that ESG performance positively impacts financial performance but negatively impacts firm value. Another research by Naeem et al. [26] underline the relationship between ESG dimensions and financial performance (ROA, ROE) and a firm's value (Tobin's Q). Whelan et al. [27] meta-analysis of articles dealing with the linkage between corporate ESG and financial performance could be considered decisive. They investigated more than 1000 research and concluded that 58% of papers found a positive connection between ESG and financial performance, 8% had a negative relationship, 13% had no relationship, and 21% had mixed results. Bhaskaran et al. [28] also investigate the impact of ESG performance on financial performance measured with ROA and ROE and firm's value expressed by Tobin's Q. They investigated 4887 firms for four years (2014-2018), and they conclude that ESG dimensions can create firms' market value. Friede et al. [29] meta-analysis of 2000 research papers concluded that most ESG and financial performance studies were performed in emerging markets. As a region of investigated firms, studies predominantly come from North America, followed by developed countries from Europe and Asia.

Behl et al. [30] also investigated the causality between ESG disclosure and the firm's value of Indian energy sector companies. Some researchers conclude that the type of ownership, the region where the firm is operating, and the degree of pollution are also important in terms of the positive impact of ESG on a firm's financial performance [31]. Based on 1720 firms data sample Aydogmus et al. [3292] found out in their research that both the ESG combined score and each

ESG component (Environment, Governance, and Social) are positively related to firms' profitability.

This research aims to investigate the impact of corporate sustainability performance on financial performance and firm value. Another research question is whether ESG performance could be linked to the corporate firm's size and capital structure.

For these, we formulated three hypotheses:

I. There is a correlation between ESG risk score and capital structure and firm size.

II. The company's financial performance expressed by Return on assets (ROA) or Return on equity (ROE) can be related to each dimensions of ESG performance/risk dimensions (E, S, G).

III. Companies' sustainability performance expressed by Sustainalytics ESG risk scores impact the investigated firm's value expressed by Tobin's Q.

3 Research Methodology

The analysis of the relationship between sustainability and financial performance is based on the financial statements of 50 listed pharmaceutical companies with the greatest market capitalization and available ESG risk rating between 2021-2022. The final models were built on the data of 47 pharmaceutical companies because data from 3 companies had been omitted from the analysis due to outliers in terms of calculated performance indicators. In this study, we would like to test that the statement "doing well while doing good" is specific to pharmaceutical companies. The main reason we used pharmaceutical companies is that drug manufacturing may be considered environmentally sensitive, among other controversial industries such as oil, gas, steel, and chemical. Jha and Rangarajan's [33] research found that a neutral or negative relationship is between sustainability and financial performance. Their study also suggests that sustainability performance shows increasing trends after 2015 in environment-sensitive and environment-non-sensitive firms. This growth is due almost to the growth of the social dimension in the case of environment-sensitive firms.

The corporate financial performance has been expressed in accounting measures by profitability ratios (ROA - Return on Assets, ROE - Return on Equity).

To measure corporate performance, we also calculate the Operating Return on Assets (OpROA) and Operating Return on Equity (OpROE). The difference between the Operating Return on Assets (OpROA), Operating Return on Equity (OpROE), and the regular Return on Assets (ROA), Return on Equity (ROE),

consists in the numerators of their ratios. While the common, above-mentioned profitability ratios are used as the numerator of the net income, the first two indicators are calculated with Earnings before interest and taxes or operating income (EBIT) in the numerator. So, the OpROA and OpROE do not consider the financial expenses as interests and taxes. These profitability ratios could be used successfully in comparative analysis of firms' performance acting in different economic sectors or tax systems. Corporate performance expressed like these provides a more accurate analysis of performance. Also, using these profitability ratios, we can eliminate the effects of taxes, which is very different for the investigated listed pharmaceutical companies. In this study, we calculated both the common profitability ratios and the ratios calculated with the EBIT numerator.

As a measure of sustainability performance, we used Morningstar's Sustainalytics ESG Risk Ratings and its three dimensions. These ESG Risk Ratings reflect a particular company's exposure to industry-specific material ESG risks and could well manage those risks. Depending on how the risk impact on firm's value, the ESG Risk scores could be ranked in 5 categories: negligible (0-10), low (10-20), medium (20-30), high (30-40), severe (40+) (Morningstar's Sustainalytics, Available on: https://www.sustainalytics.com/esg-data, accessed: 25 October 2023).

In the first part of our research, we present the main statistics of investigated financial performance measures: ROA, ROE, and sustainability performance: Sustainalytics ESG Risk Ratings. In the second part of our analysis, we would like to test whether there is a correlation analysis between ESG score and financial performance, capital structure, and firm size (H1). In the next part of the analysis, we perform the linear regression in order to check the impact of three dimensions of ESG risk score on financial performance (H2), ESG risk rating, firms' size, and capital structure on a firm's value (H3). In this model, we expressed the firm's size as a total assets logarithm. We used the Leverage ratio (Debt/Equity) to express the capital structure. To test if the resulting coefficients of the model are statistically significant, we performed the necessary statistical tests. In order to test the possible relationships between used independent variables, we performed multicollinearity analysis using the variance inflation factor (VIF).

Critical VIF=1/(1-R^2)

The critical variance inflation factor (VIF) could be calculated using the abovementioned formula. The model is acceptable if the variance inflation factor of each explanatory variable used in the model is lower than the critical VIF. Different literatures specify different values above which the multicollinearity of the model is no longer accepted. According to Vittinghoff [34], multicollinearity exists if the VIF is greater than 10, so the model could not be accepted. According to James [35], it is also problematic if the VIF is greater than 5 or greater than 10. In Menard's [36] approach, a VIF greater than 5 is cause for concern, but a VIF greater than 10 indicates a serious collinearity problem. The most restrictive

approach is that of Johnston [37] stating that a VIF less than or equal to 2.5 means significant collinearity.

As a measure of firms' value, we calculate Tobin's Q. The Tobin's Q measure of pharmaceutical firms' value is a modern approach to assessing companies' value. This market-based approach is much more preferred than accounting-based firm value indicators. Considering that we analyze listed pharmaceutical companies, this measure is much more suitable to express the company's value market based on the stock market. Tobin's Q is calculated as a ratio of the firm's market capitalization and total assets. Several studies dealing with the relationship between ESG performance and financial performance used market-based Tobin's Q [38] [39] [33]. The calculations were performed in the R statistics program system by using the 'fPortfolio', 'lm', and 'StatDA' modules.

4 Results of Research

Table 1 presents the descriptive statistics of the indicators used. Here, we present only the variables that remain in the proposed models. In terms of average financial performance, the examined pharmaceutical companies work with significant, acceptable financial performance levels (OpROA, ROE). It can also be seen that investigated companies are much more variable in terms of ROE against OpROA. This fact is confirmed on the one hand by the higher value of standard deviation and coefficient of variance and, on the other hand, by the range and interquartile range. This difference could be explained by the fact that the capital structure expressed by Leverage (D/E) of the investigated pharmaceutical companies is relatively variable. By analyzing the standard deviation, variance, and interquartile range of Tobin's Q, it can be stated that investigated firms are quite different in terms of firm value. Tobin's Q variance and standard deviation show the most significant value, meaning that enterprises are quite different regarding this aspect.

In cases of these two indicators, the greater value than 100% of the coefficient of variance also confirms the high heterogeneity of investigated companies on the aspect of ROE and Tobin's Q. The average Tobin's Q value is greater than 4.5, which means the investigated companies market value is higher than the total assets value which indicate that markets overvalue companies value.

Table 1
Main statistics of used variables

	OpROA	ROE	Tobin's Q	ESG risk	Environment risk	Social risk	Governance risk

Nobs	47.000	47.000	47.000	47.000	47.000	47.000	47.000
Minimum	-0.079	-4.361	0.003	11.000	0.000	3.700	5.200
1. Quartile	0.062	0.149	1.412	22.000	1.100	12.100	7.650
Median	0.101	0.226	2.117	25.000	2.100	14.000	8.800
3. Quartile	0.135	0.313	3.601	28.000	3.000	16.350	10.000
Maximum	0.288	2.391	52.464	41.000	5.400	24.200	14.800
Mean	0.103	0.104	4.705	25.043	2.153	13.906	8.943
Variance	0.005	1.193	91.381	38.824	2.006	17.184	4.336
Stdev	0.070	1.092	9.559	6.231	1.416	4.145	2.082
Skewness	0.121	-2.644	4.019	0.098	0.435	-0.341	0.609
Kurtosis	0.560	8.147	15.793	0.270	-0.480	0.207	0.249
CV	68.24%	1054.86%	203.17%	24.88%	65.78%	29.81%	23.28%

Source: Own computation in R statistics

Based on the average value of ESG risk rating (25.04), the investigated companies have a medium ESG risk level. The basic statistics of ESG risk rating show moderate variability and heterogeneity. By analyzing the distribution between ESG dimensions, it can be stated that the social dimension represents the most significant part of the overall ESG risk score is represented by the Social dimension (55.53%), followed by the Governance dimension (35.71%). Regarding ESG risk ratings, the variance and standard deviation of the investigated pharmaceutical firms are relatively variable. The coefficient of variance shows lower heterogeneity in terms of ESG risk ratings. In terms of variance and standard deviation, relatively high variability can be seen in the case of Social risk. In contrast, the investigated firms are less variable in terms of the coefficient of variance.

Graph. 1 presents the distribution of used dependent variables in the used models (OpROA, Tobin's Q). By analyzing both the graph and values of skewness and kurtosis, it can be stated that the OpROA distribution is much more appropriate than the standard normal distribution. In the case of Tobin's Q, the kurtosis shows values greater than 0, which means a high degree of peakedness of investigated data, so a leptokurtic distribution is specific. By examination of skewness values, we can observe that in the case of OpROA, the value is relatively close to 0, so a quite symmetrical, normal distribution is specific. Compared with the OpROA skewness value, Tobin's Q skewness value shows a slightly worse situation in terms of symmetricity. The great positive value means a right-tailed, positive-skewed distribution. Graph 1. also confirms these facts.

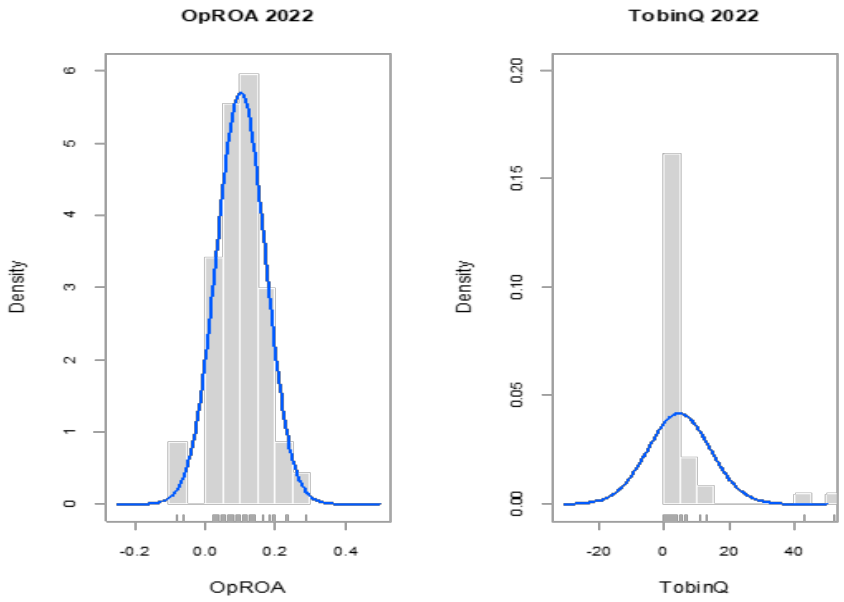

Figure 1
Distribution of used variable (2022)
Source: Own computation in R statistics

In order to test the first formulated hypothesis (H1), we performed a correlation analysis. In the Pearson correlation analysis, we used all the variables used later in the linear regression analysis. The correlation was performed on the 2022 pharmaceutical companies' sample. The correlation matrix shows a positive correlation between ROA, OpROA, and Tobin'Q, which means that firms' performance impacts firms' value.

Table 2
Results of correlation analysis between used variables

	ROA	**ROE**	**OpROE**	**OpROA**	**TobinsQ**	**Leverage**	**LogTA**	**ESGRisk**	**Erisk**	**Srisk**	**Grisk**
ROA	1.000	0.106	0.103	0.885	0.350	0.003	0.007	0.025	-0.131	0.080	0.027
ROE	0.106	1.000	0.976	0.108	0.131	0.862	0.106	-0.072	-0.338	-0.066	0.141
OpROE	0.103	0.976	1.000	0.138	0.135	0.760	0.065	-0.060	-0.310	-0.057	0.137

OpROA	0.885	0.108	0.138	1.000	0.360	0.046	-0.126	-0.181	-0.223	-0.105	-0.165
TobinsQ	0.350	0.131	0.135	0.360	1.000	0.065	-0.182	-0.123	-0.078	-0.136	-0.048
Leverage	0.003	0.862	0.760	0.046	0.065	1.000	0.108	-0.202	-0.393	-0.176	0.023
LogTA	0.007	0.106	0.065	-0.126	-0.182	0.108	1.000	0.376	-0.051	0.392	0.379
ESGRisk	0.025	-0.072	-0.060	-0.181	-0.123	-0.202	0.376	1.000	0.469	0.914	0.850
Erisk	-0.131	-0.338	-0.310	-0.223	-0.078	-0.393	-0.051	0.469	1.000	0.152	0.417
Srisk	0.080	-0.066	-0.057	-0.105	-0.136	-0.176	0.392	0.914	0.152	1.000	0.639
Grisk	0.027	0.141	0.137	-0.165	-0.048	0.023	0.379	0.850	0.417	0.639	1.000

Source: Own computation in R statistics

This relationship could be explained by the fact that both ROA and Tobin's Q use Total assets in their formulas. ROE, OpROE, OpROA, and environmental risk could have a negative relationship. In the case of OpROA and ESG Risk ratings and its dimensions, a negative correlation could be observed. The average ESG risk rating is also negatively correlated with the OpROA, Tobin's Q, and the Leverage and positively correlated with the companies' size expressed by log(Total Assets). From each dimension of ESG, the social and governance dimensions show a positive correlation with companies' size. Based on the correlation analysis results, the ESG risk score could be linked with the firm's capital structure and size, so the first hypothesis (H1) could be confirmed. As we can see from Table 2, the ESG risk score is positively correlated with firms' size and negatively correlated with the Leverage calculated as a ratio of Total Debt and Equity.

In order to test the second hypothesis, we used linear regression, where we used OpROA as the dependent variable and the dimensions of ESG risk score as independent variables. We use the change in the OpROA indicator between 2021-2022 as a dependent variable. The results of linear regression show, with one exception, that the regression coefficients are significant.

Table 3
Results of linear regression (Dependent variable: ΔOpROA)

Independent variables	Estimation	Std. Error	T- value	Pr(>|t|)
Intercept	0.1412	0.7440	0.1900	0.8504
Environment Risk	0.1953	0.1307	1.4940	0.1424
Social Risk	0.1465	0.0528	2.7760	0.00812**
Governance Risk	-0.2753	0.1142	-2.4100	0.02029*
R - squared (R^2)	0.1730			
Coefficient of correlation (R)	0.4159			

Source: Own computation in R statistics

Based on the results of the coefficient of determination and coefficient of correlation, there is a weak, medium relationship between the individual components of ESG risk and the financial performance measured by OpROA.

While the environmental and social component has a positive effect on financial performance, the corporate management aspects are negatively correlated with financial performance. In this research, we also test the multicollinearity of the explanatory variables that are used. The critical variance inflation factor (critical VIF) is 1.146. From the calculated VIF values of each dimension of ESG risk rating (Environment risk: 1.243; Social risk: 1.736; Governance risk: 2.05), it can be seen that only the Environment risk variable VIF value is situated below the critical VIF value, which means that there can be collinearity between used explanatory variables. It can also be stated that VIF in each case is situated below 2.5, which is the most restrictive approach, as suggested by Johnston et al. (2017). Regarding this result, we consider that the ΔOpROA regression model could be regarded as questionable in terms of multicollinearity.

Table 4
Variance-analysis / ANOVA table for ΔOpROA

	Degree of freedom	Sum of square	Mean of square	F-value	F-test
nvironment Risk	1	0.778	0.778	0.614	0.43771
Social Risk	1	3.262	3.262	2.573	0.11605
Governance Risk	1	7.366	7.366	5.81	0.02029
Residuals	43	54.524	1.268		

Table 4 shows the Sum of Squares deviation between the original ΔOpROA and the estimated performance value change. Related to variance analysis, the F-test answers the question of whether the model is acceptable in how well the used independent variables (Environmental Risk, Social Risk, Governance Risk) can explain the ΔOpROA. The F-value is the ratio between Mean Squares (ΔOpROA) and Sum Squares (Error). It can be seen that the F-test significance level is relatively close to 0 in the case of Governance Risk – explanatory variable. Based

on these results, it can be stated that in the case of governance risk, the effect of the explanatory variable effect is significantly greater than the effect of the error. This means we can accept the null hypothesis, according to which the variance of the independent variable can well explain the variance of the dependent variable. In this case, this is also partially true. In this case, this could be partially confirmed. Based on the results of regression analysis and the variance analysis of ΔOpROA, the second hypothesis (H2) could be partially confirmed, according to which the company's financial performance can be related to each dimension of ESG risk score (E, S, G).

In the next part of our analysis, we also performed regression analysis to investigate the impact of ESG Risk Rating scores, Leverage, and firms' size on firms' value expressed by Tobin's. The main research question here is whether ESG risk score, capital structure, and firm size could explain the firms' value.

Table 5
Results of linear regression (Dependent variable: ΔTobin's Q)

Independent variables	Estimation	Std. Error	T- value	Pr(>|t|)
Intercept	0.0264	0.0128	2.0620	0.0453*
ESG Risk	-0.0011	0.0005	-2.1360	0.0384*
Log(TA)	-2.1537	0.0710	-30.3170	<2e-16***
Leverage (D/E)	-0.0003	0.0001	-2.3950	0.0210*
R - squared (R2)	0.9596			
Coefficient of correlation (R)	0.9796			

Source: Own computation in R statistics

Based on the results of the coefficient of determination and correlation, it can be stated that there is a strong relationship between ESG risk rating score, capital structure firm's size, and firm's market value calculated by Tobin's Q. By analyzing Table 4, we can observe that the significance level for each coefficient value is around 0, which means that the computed coefficients can be successfully used in order to explain the evolution of dependent variable, the Tobin's Q. It can also be seen that ESG Risk rating level, the size of investigated pharmaceutical companies, and leverage expressed by (D/E) negatively impact the firms' value expressed by Tobin's Q. So, with exception of Intercept, all independent variable negatively impact the Tobin' Q.

The critical variance inflation factor (critical VIF) is 24.75. It can be seen that the calculated VIF values of each explanatory variable (ESG Risk rating: 1.099; Log(Total Assets): 1.105; Leverage: 1.111) are situated below the critical VIF value, which means that there is no multicollinearity between used explanatory variables. In each case, the VIF is situated below 2.5, which is the most restrictive approach, as suggested by Johnston et al. (2017). Regarding this result, we consider that ΔTobin's Q regression model is adequate in terms of multicollinearity.

In the next part of our analysis, we performed the variance analysis for the above-mentioned regression model, in which the dependent variable is Tobin's Q change between 2021 and 2022.

Table 6
Variance-analysis / ANOVA table for ΔTobin's Q

	Degree of freedom	Sum of square	Mean of square	F-value	F-test
ESG Risk	1	0.3066	0.03066	73.3505	1.02e-10***
Log(TA)	1	0.39442	0.39442	943.4639	<2.2e-16***
Leverage (D/E)	1	0.0024	0.0024	5.7367	0.02104*
Residuals	43	0.01798	0.00042		

According to results from Table 6. it can be stated that it is acceptable in the sense of how well the independent variables can explain the investigated firms' value change expressed by Tobin's Q. Taking into consideration that F- value's significance levels are very closed to 0, we can conclude that the explanatory variable effect is significantly greater than the error effect. This means the regression model will be suitable for analyzing of this kind of relationship. So, we can reject the null hypothesis; the variance of the independent variable can well explain the variance of the dependent variable. This is also suggested by the'***' and '**' signs, which show significance levels very close to 0. Based on the results, companies' sustainability performance expressed by Sustainalytics ESG risk scores, the capital structure, and the firm's size impact on the investigated firm's value expressed by Tobin's Q. Based on these, the third hypothesis (H3) could be confirmed.

Conclusion

The responsibility of companies to reduce the negative effects of climate change is evident. This article presents the analysis of the impact of corporate sustainable performance on the financial performance and the firm's value for a sample of 47 pharmaceutical companies. In this study, we would like to test that the statement "doing well while doing good" is specific to pharmaceutical companies. The reason why we used pharmaceutical companies is that drug manufacturing may be considered an environmentally sensitive industry among other controversial industries such as oil, gas, steel, and chemical industries.

Based on the results of the main statistics, we can summarize that the investigated pharmaceutical companies work with medium ESG risk levels and significant, acceptable financial performance in terms of ROA and ROE. The distribution between ESG risk rating dimensions shows that the greatest part of the overall ESG risk score is represented by the Social dimension (55.53%), followed by the Governance dimension (35.71%). The coefficient of variance and the interquartile range show that the ESG risk ratings are moderately variable and heterogeneous in

the sample of investigated pharmaceutical firms. The results show that investigated companies are much more variable in terms of ROE, which means that analyzed pharmaceutical firms are quite different regarding Leverage (D/E). Based on the average value of Tobin's Q, it can be seen that companies' value is significantly overvalued by the markets. The main statistics show us that investigated firms are quite different regarding their firm value. The distribution of OpROA is quite close to normal distribution against the asymmetric and right-tailed distribution of Tobin's Q.

Based on correlation analysis, it can be stated that there is a positive correlation between ROA, OpROA, and Tobin'Q, which means that firms' performance impacts firms' value. The ROE, OpROE, and OpROA are negatively correlated with environmental risk. The average ESG risk rating is negatively correlated with OpROA, Tobin's Q, and Leverage and positively correlated with the companies' size expressed by log(Total Assets). The Social and Governance dimension of ESG risk rating could be linked with firms' size. ESG risk score could be linked with firms' capital structure and size, so the first hypothesis (H1) could be confirmed. There is a weak-medium relationship between individual dimensions of ESG risk score and the financial performance measured by OpROA change. Mixed results can be observed in terms of ESG risk components. While the environmental and social dimension has a positive effect on financial performance (ΔOpROA), the corporate management aspects are negatively correlated with financial performance. The second hypothesis (H2) could be partially confirmed, according to which the company's financial performance can be related to certain dimensions of ESG risk score (E, S, G). Regarding the results of the second regression model, it can be stated that there is a strong relationship between ESG risk rating score, capital structure firm's size, and firm's market value calculated by Tobin's. Based on the results, companies' sustainability performance expressed by Sustainalytics ESG risk scores, the capital structure, and the firm's size impact on the investigated firm's value expressed by Tobin's Q. Based on these, the third hypothesis (H3) could be confirmed. By analyzing the distribution between ESG components, it can be seen that the social dimension represents a significant part of the overall ESG risk score.

The limits of this research are clear, and we consider that by expanding the company sample and including new variables, the examination of the relationship between ESG performance and financial performance and firms' value can be improved.

References

[1] Elkington, J. Cannibals with Forks: The Triple Bottom Line of 21st Century Business. Capstone, Oxford 1997(accessed 10 October 2023)

[2] Schoenmaker. D. From risk to opportunity. A framework for sustainable finance, Rotterdam School of Management, Erasmus University, Rotterdam, 2017 (accessed 17 October 2023)

[3] KPMG Big shifts, small steps. Survey of Sustainability Reporting 2022. KPMG. Available online. https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2022/10/ssr-executive-summary-small-steps-big-shifts.pdf. 2024.02.12

[4] Lehenchuk, S., Zhyhlei, I., Ivashko, O., Gliszczyński, G. The Impact of Sustainability Reporting on Financial Performance: Evidence from Turkish FBT and TCL Sectors. Sustainability 2023, 15(20), 14707; https://doi.org/10.3390/su152014707

[5] Keskin, A. I. Dincer, C. Nexus between Sustainability Reporting and Firm Performance: Considering Industry Groups, Accounting, and Market Measures. Sustainability 2023, 15(7), 5849; https://doi.org/10.3390/su15075849

[6] Rachmat, L. M., Sumirat, E., Nainggolan, Y. A. The Influence of Sustainability Disclosure on Financial Performance: A Study of Indonesian Firms. International Journal of Current Science Research and Review 2024 7(3)

[7] Kashirskaya, L. V., Sitnov, A. A., Davlatzoda, D. A., & Vorozheykina, T. M. Knowledge audit is a key tool for business research in the information society. Entrepreneurship and Sustainability Issues, 2020, 7(3), pp. 2299-2319, Available at: https://doi:10.9770/jesi.2020.7.3(56) (accessed 19 October 2023)

[8] Gillan, S. L., Koch, A., & Starks, L. T. Firms and social responsibility: A review of ESG and CSR research in corporate finance. Journal of Corporate Finance, 2021, 66, 101889 (accessed 15 October 2023)

[9] Buallay, A. Between cost and value: Investigating the effects of sustainability reporting on a firm's performance. Journal of Applied Accounting Research, 2019, 20(4) pp. 481-496 Available at: https://doi.org/10.18372/2307-9061.62.16489 (accessed 10 October 2023)

[10] Wang, J. – Zhang Y. & Goh, M.. Moderating the Role of Firm Size in Sustainable Performance Improvement through Sustainable Supply Chain Management, Sustainability 2018, 10, 1654; Available at: doi:10.3390/su10051654, (accessed 18 October 2023)

[11] Abdi, Y., Li, X. & Càmara-Turull, X. Exploring the impact of sustainability (ESG) disclosure on firm value and financial performance (FP) in the airline industry: the moderating role of size and age. Environ Dev Sustain 2022, 24, pp. 5052-5079, Available at: https://doi.org/10.1007/s10668-021-01649-w (accessed 10 October 2023)

[12] Baron, D. P., Harjoto, M. A., Jo, H. The Economics and Politics of Corporate Social Performance. Working Paper No. 45, Stanford University Graduate School of Business 2009

[13] Garcia, A. S. Mendes-Da-Silva, W., Orsato, R. Sensitive industries produce better ESG performance: Evidence from emerging markets, Journal of Cleaner Production 2017, 150, pp. 135-147, Available at: http://dx.doi.org/10.1016/j.jclepro.2017.02.180 (accessed 21 October 2023)

[14] Fain, M. A vállalati társadalmi teljesítmény rövid távú hatásai a pénzügyi jövedelmezőségre. Köz-Gazdaság – Review of Economic Theory and Policy 2020 15(2), pp. 163-179 (accessed 10 October 2023)

[15] Buallay, A. Between cost and value: Investigating the effects of sustainability reporting on a firm's performance. Journal of Applied Accounting Research, 2019, 20(4), pp. 481-496, Available at: https://doi.org/10.18372/2307-9061.62.16489 (accessed 10 October 2023)

[16] Kass, A. Towards mainstreaming integrated reporting – Theoretical landscape and practical insights. Munich, Grin Verlag GMBH. 2013, Available on: https://www.grin.com/document/192043 (accessed 17 October 2023)

[17] Gao, Y., - Han, K. Managerial overconfidence, CSR and firm value. Asia-Pacific Journal of Accounting & Economics 29, 1600-1618, 2020 Available at: doi:10.1080/16081625.2020.1830558 (accessed 22 October 2023)

[18] Bodarenko, T. – Prodanova, N. – Borodin, A. – Kokorev, A. & Kairbekuly, A. The role of non-financial reporting in corporate sustainability of pharmaceutical industry, Sys Rev Pharm, 2020; 11(12), pp. 1514-1522 (accessed 10 October 2023)

[19] Liu, X.; Anbumozhi, V. Determinant Factors of Corporate Environmental Information Disclosure: An Empirical Study of Chinese Listed Companies. J. Clean. Prod. 2009, 17, pp. 593-600 (accessed 17 October 2023)

[20] Krüger, F. Corporate storytelling: Theorie und empirie narrativer public relations in der unternehmenskommunikation. Berlin, Germany: Springer-Verlag, 107. 2015, accessed 15 October 2023)

[21] Kim, B., & Lee, S. The impact of material and immaterial sustainability on firm performance: The moderating role of franchising strategy. Tourism Management, 2020, 77, 103999 (accessed 17 October 2023)

[22] Theodoulidis, B., Diaz, D., Crotto, F., & Rancati, E. (2017) Exploring corporate social responsibility and financial performance through stakeholder theory in the tourism industries. Tourism Management, 62, 173-188 (accessed 10 October 2023)

[23] McWilliams, A., & Siegel, D. Corporate social responsibility: A theory of the firm perspective. Academy of Management Review, 2001, 26(1), pp. 117-127 (accessed 9 October 2023)

[24] Koundouri, P.; Pittis, N.; Plataniotis, A. The Impact of ESG Performance on the Financial Performance of European Area Companies: An Empirical

Examination. Environ. Sci. Proc. 2022, 15, 13, Available on: https://doi.org/10.3390/ environsciproc2022015013 (accessed 17 October 2023)

[25] Naeem, N. & Çankaya, S. The impact of ESG performance over financial performance: A study on global energy and power generation companies, International Journal of Commerce and Finance, 2022, 8(1), pp. 1-25 (accessed 10 October 2023)

[26] Naeem, M., Ullah, H., Shahid, J., & Kakakhel, S. J. The impact of ESG practices on firm performance: Evidence from emerging countries. Indian Journal of Economics and Business, 2022, 20, 1 (accessed 17 October 2023)

[27] Whelan, T., Atz, U., Holt, T. V., & Clark, C. ESG and financial performance: Uncovering the relationship by aggregating evidence from 1,000 plus studies published between 2015-2020. NYU Stern Center for Sustainable Business, Rockefeller Asset Management 2021 (accessed 18 October 2023)

[28] Bhaskaran, R. K., Ting, I. W. K., Sukumaran, S. K., & Sumod, S. D. Environmental, social and governance initiatives and wealth creation for firms: An empirical examination. Managerial and Decision Economics, 2020, 41(5), pp. 710-729 (accessed 10 October 2023)

[29] Friede, G., Busch, T. & Bassen, A. ESG and financial performance: aggregated evidence from more than 2000 empirical studies Journal of Sustainable Finance & Investment, 2015, 5(4), pp. 210-233, Available on: doi: 10.1080/20430795.2015.1118917 (accessed 10 October 2023)

[30] Behl, A., Kumari, P. S. R, Majhija, H, Sharma D. Exploring the relationship of ESG score and firm value using cross-lagged panel analyses: the case of the Indian energy sector, Annals of Operations Research. 2021 Available at: https://doi.org/10.1007/s10479-021-04189-8 (accessed 10 October 2023)

[31] Fu, T. & Li, J. An empirical analysis of the impact of ESG on financial performance: the moderating role of digital transformation. Front. Environ. Sci. 2023, 11:1256052, doi: 10.3389/fenvs.2023.1256052 (accessed 17 October 2023)

[32] Aydogmus, M., Gülay, G. & Ergun, K. Impact of ESG performance on firm value and profitability, Borsa Istanbul Review 22-S2 (2022) S119-S127 (accessed 10 October 2023)

[33] Jha, M. K & Rangarajan, K. Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context, Asian Journal of Sustainability and Social Responsibility, 2020 5(10) Available at: https://doi.org/10.1186/s41180-020-00038-z (accessed 9 October 2023)

[34] Vittinghoff E, Glidden DV, Shiboski SC, McCulloch CE. Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models, Springer, 2011 (accessed 17 October 2023)

[35] James G, Witten D, Hastie T, Tibshirani R. An Introduction to Statistical Learning: With Applications in R, Springer, 2013

[36] Menard S. Applied Logistic Regression Analysis, SAGE Publications, Inc., 2011

[37] Johnston, R., Jones, K., and Manley, D. Confounding and collinearity in regression analysis: A cautionary tale and an alternative procedure, illustrated by studies of British voting behaviour, Quality & Quantity, 2017, 52(4), pp. 1957-1976 (accessed 17 October 2023)

[38] Atan R, Alam MM, Said J, Zamri M. The impacts of environmental, social, and governance factors on firm performance: a panel study of Malaysian companies. Manag Environ Quality Int J, 2018, 29(2) pp.182-194 (accessed 10 October 2023)

[39] Buallay A. Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector. Manag Environ Quality Int J 2019, 30(1) pp. 98-115 (accessed 10 October 2023)