



ESG REPORTING IMPLICATIONS FOR ROAD CARRIERS' FINANCIAL OUTCOMES

Desislava Yosifova*, Magdalena Petrova-Kirova

Todor Kableshkov University of Transport, Faculty of Transport Management, Bulgaria

Abstract: Until the end of 2023, European legislation does not impose an obligation but provides freedom to companies whether to implement ESG reporting. The conceptual idea of the study is to verify whether and to what extent non-financial ESG reporting of companies - road transport companies, has an impact on their financial results and subsequent business behavior (of their management and of external stakeholders - contractors and others).

The analyzed sample includes 12 companies: 2 large Bulgarian companies from road freight transport (internationally licensed) and an additional sample of 10 SME- subsidiaries of large foreign companies (when forming control groups for the needs of the difference-in-differences analysis). These companies operate on Bulgarian territory, have ESG reporting and are related to the transport, logistics, courier sectors, as well as the field of communications and telecommunications services. To evaluate the results and test the research hypotheses, value analysis methods, as well as statistical methods and models, were used. The regression model was tested for the absence of multicollinearity, autocorrelation and heteroskedasticity. The data included in the study were processed by Gretl statistical software. A difference-in-differences analysis was conducted using Stata software to trace (possibly confirm) a causal relationship and measure the effect of ESG Reports disclosure. The constructed multiple regression model is based on an accounting-oriented approach focused on operating profit. After performing correlation and regression analysis and according to the constructed models, the presence of a relationship and dependence between the values of the calculated indicators and EVA was verified and established.

Keywords: road companies, ESG reporting, corporate sustainability, financial outcomes; regression & correlation dependence.

* Corresponding author: diosifova@abv.bg

Desislava Yosifova, ORCID: 0009-0007-1430-6093

Magdalena Petrova-Kirova, ORCID: 0009-0008-3550-6438

1. INTRODUCTION

For the purposes of this study, the research sample included a total of 12 /twelve/ enterprises – two large Bulgarian companies that carry out freight road transport and ten small and medium-sized Bulgarian subsidiaries of foreign enterprises as an additional control sample created for the needs of the difference-in-differences analysis.

For the research 7-year period (2017-2023), European and Bulgarian legislation does not oblige the companies included in the sample but provides them with a voluntary opportunity to prepare an ESG report and, accordingly, to choose an existing international standardization base (The European Parliament Directive (EU) 2022/2464, 2022).

2. LITERATURE REVIEW

In recent decades, a number of analysts have researched the impact of factors influencing the disclosure of social and environmental information by companies working in various economic industries (Petrova-Kirova & Yosifova, 2024). A large part of the inquiries study factors affecting the extent of information disclosure on environmental and social performance such as enterprises categories based on quantitative criteria (average number of employees, book value of the assets, net sales revenue) various profitability ratios, indicators of financial leverage, commercial reputation (Dyduch & Krasodomska, 2017; Echave, 2010; Szadzińska et al., 2018).

Some of the research conducted confirms while others reject and do not link ESG reporting practices to companies achieving certain financial outcomes. For some companies a direct relationship is established between Return on Assets, Return on Equity and various social and environmental indicators (Churet & Eccles, 2014; Dragu & Tiron-Tudor, 2013; Borodin & Shash, 2019).

In this regard, part of the factors described above is included as variables in an analytical model for the necessities of the study. In order to evaluate the results, the toolkit of financial analysis (accounting-oriented approach and value analytical methods) was used, as well as statistical methods and models.

To improve the quality of the research results, the regression model was tested for the absence of multicollinearity, autocorrelation and heteroskedasticity.

The data included in the study was processed by Gretl statistical software. A difference-in-differences analysis was conducted using Stata software in order to trace (search for and possibly prove) a causal relationship and measure the effect of ESG disclosure.

3. METHODOLOGY BASED ON AN ACCOUNTING-ORIENTED APPROACH

According to the research conducted on the possible impact of the picked factors on the scope of disclosed ESG information, the following multiple regression model was built.

$$FP_{it} = \alpha_0 + \alpha_1 ESG_{1it-1} + \alpha_2 SIZE_{2it-1} + \alpha_3 RISK_{3it-1} + \varepsilon_{it} \quad (1)$$

The model construction is based on an accounting-oriented approach focused on the operating profit of the company. The Return on Sales Ratio (ROS) is used as an indicator to measure the efficiency of the company's activity.

ESG_{it-1} – Disclosure Index (DI_{esg}) of environmental and social performance indicators:

$$DI_{\text{esg}} = \sum D_{\text{id}} / \sum D_{\text{i (total)}} \quad (2)$$

$\sum D_{\text{id}}$ – the sum of the number of disclosed environmental and social indicators.

$\sum D_{\text{i (total)}}$ – the sum of the total number of possible environmental and social indicators.

$SIZE_{it-1}$ – size of the company for the previous reporting period. The index is proportional to the book value assets of the company.

$RISK_{it-1}$ – this ratio measures the financial dependence of the company or Financial Leverage Ratio. Correct risk management is a guarantee for successful and sustainable business development (Kolev, 2024).

4. DATA AND RESULTS

Correlation analysis was performed to examine the dependence between financial outcomes (ROS) and disclosure of ESG information (disclosure index DI was used) with a time lag of 1 year.

The obtained result shows a one-way (directly proportional) medium-strength relation between the two variables, with a correlation coefficient of $r \approx 0.54$ (table 1). Therefore, as the amount of ESG information disclosed in a given reporting year increases, the Return on Sales Ratio for the next reporting year increases.

Table 1. Correlation coefficient

Variables	ROS (y)	NFI (x)
ROS (y)	1,000000	
NFI (x)	0,5377	1,000000

Source: based on own calculations and Gretl Software

In this regard, the influence of three factor variables - disclosure of ESG information, company size and financial leverage for a given reporting period, on the Return on Sales (ROS) for a subsequent reporting period was investigated.

$$ROS_{it} = a_0 + a_1 ESG_{it-1} + a_2 SIZE_{it-1} + a_3 RISK_{it-1} + \varepsilon_{it} \quad (3)$$

In order to test the existence of independence within factor variables and therefore presence or absence of multicollinearity, the following correlation matrix was constructed:

Table 2. Multicollinearity test

Variables	ESG (x)	SIZE (x)	RISK (x)
ESG (x)	1,000000		
SIZE (x)	-0,051121	1,000000	
RISK (x)	-0,490763	-0,060641	1,000000

Source: based on own calculations and Gretl Software

Based on the results obtained from the correlation matrix above, the existence of multicollinearity is rejected. It is summarized that all three factor variables: ESG information (through the disclosure index), company size (with the calculated index) and leverage ratio, can remain in the model proposed above and be analysed.

The value of the Durbin-Watson coefficient based on the calculation results is approximately equal to $d \approx 2,00$. Comparing the empirical and theoretical values no autocorrelation was found.

White and Breusch-Pagan (BP) tests were additionally performed using the statistical software (Gretl). The results confirm the absence of heteroskedasticity in the model.

A regression analysis was performed which shows that the empirical significance of the F-criterion exceeds its theoretical significance at $\alpha = 0.05$. In this regard, at $\text{Sig } F < \alpha$, it should be assumed that more detailed disclosure of ESG information for a given reporting period affects the financial outcomes for the following reporting period(s) to some extent.

5. METHODOLOGY BASED ON A VALUE ANALITICAL APPROACH AND DID ANALYSIS

To assess the impact of ESG reporting on the financial outcomes of the company and, respectively, on the value creation over time key ESG indicators are derived for transport and logistics companies. They have been determined as material based on an in-depth analytical review of the annual reports of the sampled companies.

Four analytical models were built to examine the influence of the key ESG indicators on the financial outcomes of the Bulgarian transport companies.

Model 1: Energy consumption within the entity

$$EVA_{it} = a_0 + a_1 ESG_{(E1)it-1} + \varepsilon_{it} \quad (4)$$

Model 2: Relative share of greenhouse gas (GHG) emissions

$$EVA_{it} = a_0 + a_1 ESG_{(E2)it-1} + \varepsilon_{it} \quad (5)$$

Model 3: Number of employee

$$EVA_{it} = a_0 + a_1 ESG_{(S1)it-1} + \varepsilon_{it} \quad (6)$$

Model 4: Improving the qualification of employee

$$EVA_{it} = a_0 + a_1 ESG_{(S2)it-1} + \varepsilon_{it} \quad (7)$$

The results of the analysis carried out in the four models based on a value analytical approach using the economic value-added indicator show the presence of a correlation dependence of different strength and direction (Kasarova, 2013).

Table 3. Summarizing the results of the correlation analysis

Models	Correlation coefficient (r)
1. $EVA_{it} = a_0 + a_1 ESG_{(E1)it-1} + \varepsilon_{it}$	-0.7543
2. $EVA_{it} = a_0 + a_1 ESG_{(E2)it-1} + \varepsilon_{it}$	-0.5186
3. $EVA_{it} = a_0 + a_1 ESG_{(S1)it-1} + \varepsilon_{it}$	-0.7913
4. $EVA_{it} = a_0 + a_1 ESG_{(S2)it-1} + \varepsilon_{it}$	0.6613

Source: based on own calculations and Gretl Software (Damodaran, 2024)

To trace a causality between the disclosure of ESG information and the financial outcomes of the studied Bulgarian companies, a difference-in-differences (DID) analysis was

conducted with the formed control group of subsidiaries from another related economic sector. These are companies from the field of logistics and communication services (related to transport services) which disclose ESG information voluntarily as part of the structure of large foreign companies.

Table 4. Difference-in-differences analysis

ROS_BG	Coefficient	Std. err.	T	P > t	[95% conf. interval]	
ESG_treated	-.016944	.0300657	-1.70	0.090	-.080101	.0398925
Time	-.047691	.0275040	-1.95	0.045	-.097854	.0005044
DID	.059691	.0395441	1.79	0.071	-.005095	.1402797
Risk	-.019776	.0095249	-2.12	0.031	-.039352	-.0024981
Size	-.005876	.0091581	-0.59	0.454	-.022579	.012786
_cons	.1806171	.0667271	2.51	0.021	.044247	.3150881

Source: based on own calculations and Stata Statistical Software

The DID coefficient reflecting the average effect of the impact of the disclosure of ESG information on the financial outcomes of the companies operating in Bulgaria indicates the existence of a certain positive effect significant at a level of 10%.

6. CONCLUSION

➤ Correlation and regression analyses were performed in the research sample and in this regard, a positive, one-way relationship and dependence was established between the disclosed ESG information for a given reporting period and the financial outcomes of the companies in subsequent reporting periods (based on an accounting-analytical approach and a built model).

➤ The annual reports of the companies were studied and key ESG indicators were derived.

➤ After performing a correlation and regression analysis, the existence of a relationship and dependence between the values of the calculated indicators and the economic value added (EVA) of Bulgarian road carriers was verified and established (based on a value analytical approach and built models).

➤ A "difference-in-differences" analysis was conducted using Stata software to investigate the effect of ESG disclosure on the financial outcomes of the studied transport companies. The existence of a causal relationship is observed at a significance level of 10%.

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