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Original Article

THE IMPACT OF ESG STRATEGIES ON GROWTH IN THE LOGISTICS INDUSTRY

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Highlights:

- analysis of the relationship between the increase in profit per share and the financial condition of enterprises measured by the AS formula;
- measures of growth opportunities based on market prices can be used to forecast the future growth of enterprises;
- measures of growth opportunities are associated with the future growth of transport and logistics enterprises and companies included in the WIG ESG index over a 3-year period;
- measures of growth opportunities are not associated with the future growth of transport and logistics enterprises and companies included in the WIG ESG index over a 5-year period;
- the study was conducted on the basis of WSE data using classic regression models and panel models.

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Abstract. The aim of the article is to analyse the relationship between company growth, measured as an increase in Earnings Per Share (EPS) in 3- and 5-year periods, and companies' financial condition, measured using the Altman z-Score (AS) model. The study was carried out on the example of companies included in the WIG Index and Warsaw Stock Exchange Index (in Polish: *Warszawski Indeks Giełdowy* – WIG) Environmental, Social, and Governance (ESG) between 2013 and 2020. Furthermore, among the companies included in the WIG index, companies belonging to the logistics industry were distinguished. An analysis of linear and panel relationships was used to verify the nature of the relationships between the variables taken into account. The z-Altman index was found to have a positive effect on company growth in a 3-year period for companies from the transport and logistics industry and all companies included in the WIG ESG index. Regarding company growth over the longer 5-year period, the influence of the z-Altman index on growth was not observed. Therefore, the results for companies in the WIG index show that for company growth in both the 3- and 5-year periods, the financial and economic condition of a company, measured by the z-Altman index, has no impact on the size of this growth, which was also confirmed by panel models.

Keywords: transport, logistics, company growth, ESG strategies, Altman model.

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Notations

AS – Altman z-score;
CSR – corporate social responsibility;
D – debt;
EPS – earnings per share;
ESG – environmental, social, governance;
n – 3- or 5-year period;
OLS – ordinary least squares;
RESET – regression specification error test;
ROA – return on assets;
SD – standard deviation;
UTP – universal trading platform;
VIF – variance inflation factor;
WERSSET – Warsaw stock exchange trading system;
WIG – Warsaw stock exchange index (in Polish: *Warszawski indeks giełdowy*).

1. Introduction

The growth of companies is related to how capital markets function. Their mechanisms make investors transfer accumulated capital to economic entities and expect an increase in the value of their shares in return. The capital invested in the company affects the growth of assets. As a result, profits should increase if the implemented investment projects are effective. The increase in profits determines the increase in the internal value of the company, which, in turn, should translate into an increase in the price of its shares and, thus, the market value and rate of return. Understanding the perspective of growth within the framework of capital market mechanisms allows us to comprehend this process from the standpoint of investors. Their expectations are primarily aligned with the rates of return on investments in business units. Simultaneously, managers have a duty to fulfil these expectations in exchange for appropriate remuneration. The role of the capital market and its institutions is crucial in the development of companies due to the access it gives them to the necessary capital.

In today's global and competitive business environment, enterprise value management is becoming an essential tool for managers and business owners. It facilitates making informed business decisions, the optimization of resource allocation, the identification of valuable areas of the business, and the adaptation of strategies to changing market conditions. Nowadays, a lot of emphasis is placed on environmental issues in the activities of enterprises. They were an impulse for the development of various concepts and systems for measuring the impact of enterprises on the natural environment. ESG initiatives are some of the most commonly used metrics for evaluating a company's performance in terms of corporate sustainability. These initiatives are particularly important for companies such as those in the logistics and transport industry, as their specific nature has a significant impact on the environment (Gündoğdu *et al.* 2023). This also applies to companies involved in warehouse logistics, where the environmental impact depends on the standards of construction of warehouse facilities and the logistics processes carried out (Kuranovič *et al.* 2023). Research in the aviation industry to determine the links between financial performance and the implementation of ESG initiatives has shown that being a "green company" (i.e., financing green initiatives) negatively impacts financial results, even though the aviation industry has a significant negative impact on the environment (Abdi *et al.* 2022). At the same time, the term ESG is used in academia in various senses and has not been clearly defined. ESG is a widely accepted concept that obliges companies to take action for sustainability, social improvement, and stakeholder well-being (Jamali, Carroll 2017). Investors in different economies consider the concept of ESG in the context of their investment strategy and decision-making (Ye *et al.* 2022). Investing sustainably and responsibly is an investment discipline that incorporates ESG criteria to generate long-term, competitive financial returns and a positive social impact (Jonwall *et al.* 2022). The outbreak of the COVID-19 pandemic reduced the efficiency of regional ESG markets, with the exception of Europe, which maintained its efficiency even during the pandemic. Global factors significantly affect the efficiency of regional markets, whereas stable economic conditions make these markets informationally efficient (Meira *et al.* 2023; Naeem *et al.* 2023).

Shaping value is one of the concepts of running a business, and it is essential to establish appropriate management processes to implement it in the economic life of the company. To ensure an increase in value for owners, it is necessary to meet the needs of other stakeholders, for example, customers, employees, or contractors. This, in turn, increases the value of the company, also for them (Jensen 2001). The philosophy of value management also emerged from the need to reduce the difference between the real and potential value of the company that results from its potential and effectiveness, and all management decisions aim to improve this state. The developed methods and techniques facilitate precise decision-making in both operational and investment activities (Egorova *et al.* 2022). The concept of shareholder value management, which refers to business sustainability, has now been superseded by true business sustainability, which encompasses the tangible actions of companies that align with sustainable development objectives (Dyllick, Muff 2016).

Globalisation greatly improves capital flows, abolishing customs barriers and influencing other facilitations, thereby eliminating the phenomenon of "easy capital". This allows capital to be quickly moved to locations that offer higher rates of return. Technical and technological progress, as well as economic growth, have resulted in the emergence of more private capital on the market, with high expectations regarding maximising the rate of return on investment (Apostoaie 2020). However, climate change, growing social disparities, and cases of amoral corporate actions have created the need for a paradigm shift in the way companies operate, with their focus now on ESG issues (Fatemi, Fooladi 2013). Schoenmaker & Schramade (2018) showed the rapidly growing interest of investors in the performance of companies that have implemented value management strategies based on ESG policies (Avetisyan, Hockerts 2017).

This study aims to illustrate how enterprises on the capital market grow, taking into account the stages of their development in the context of incorporating sustainable development principles into their development policies. A comparison between companies belonging to the ESG sector and those outside it was also presented. The authors conducted research on companies included in the WIG index. The purpose of this comparison is to demonstrate whether companies implementing an ESG strategy have greater opportunities for growth. In addition, companies from the transport and logistics industry were separated and transferred separately from the companies included in the WIG index. The selection of transport companies for the research sample was related to

their significant role in the socioeconomic development of countries and their considerable negative impact on the natural environment. In the context of the study, it is crucial to ascertain whether companies with an implemented ESG strategy have development opportunities. To this end, the following hypotheses were formulated:

- H1: the implementation of an ESG strategy positively influences the growth of the company's value on the capital market;
- H2: the relationship between the AS and corporate growth is positive for logistics companies with an implemented ESG strategy.

These 2 hypotheses (H1 and H2) comprehensively illustrate the scope of research on the impact of ESG strategies on company value, both for logistics companies and all companies included in the WIG index.

The article consists of 5 parts:

- section 1 – introduction;
- section 2 describes the theoretical background of the study;
- section 3 presents the research methods and statistical data;
- section 4 discusses the results;
- section 5 contains general conclusions and indicates directions for further research.

2. Literature review

The market value of a company reflects the most likely price at which it can be bought or sold in a sufficiently competitive and open market. This assessment considers all the conditions of a fair transaction, assuming that buyers and sellers act rationally, have no specific motivations, and use reliable information (Lantos 2001). As part of enterprise value management, several important decisions are made to effectively control the company's operations and generate maximum value for shareholders and other stakeholders. Using the right approach, a company can achieve a competitive advantage and increase its market value (Griškevičiūtė-Gečienė 2010). Capital allocation begins with identifying potential investment projects, assets, or strategies that can contribute to the growth of the company's value. The enterprise must also consider strategic value goals and a long-term development strategy to ensure that the selected projects are in line with these goals (Muhammad, Scrimgeour 2014).

Companies are increasingly adopting the maximisation of the company's value as their main goal. However, determining value is very complex because there is no single, universally accepted method of measuring status (El Hakioui, Louitri 2017). To assess management effectiveness, it is necessary to identify factors that affect value and create measures to assess the strength and quality of processes. There are 2 types of performance measures: absolute and relative. Absolute measures assess performance within a specific timeframe, while relative measures compare performance to the value of capital employed (Battall *et al.* 2020).

Currently, sustainable development is the subject of a wide scientific discourse that covers various disciplines and occupies an important place in economic practice (Dasgupta 2007; Acosta Castellanos, Queiruga-Dios 2022). The literature on the subject emphasises its complex and holistic nature, which manifests itself in different approaches to how it is conceptualised (Mathiasson, Jochumsen 2022).

Implementing the concept of sustainable development requires the participation of states, international institutions and organisations as well as whole communities (Bose, Khan 2022; Szychta 2022). A special place is occupied by companies that are widely recognised as having contributed the most to environmental degradation (Brzeziński, Pyza 2021; D'Angelo *et al.* 2023). Previous studies only presented the results of companies that implemented ESG strategies, without any broader comparison (Chow *et al.* 2014). These studies used ratings provided by various rating agencies, i.e., *Refinitiv Eikon*, *Bloomberg*, *MSCI*, *Sustainalytics*, *Dow Jones*, and *Corporate Knights* (Huber, Comstock 2017).

Hamilton (1995) showed that developed financial markets can react to a company implementing an ESG strategy in 3 different ways:

- the market is unable to evaluate the ESG strategy effectively – investors have difficulties valuing the potential benefits or costs of ESG, which is especially true in developing markets;
- the market positively evaluates the implementation of the ESG strategy – investors associate the company's good results with its ESG strategy, which is especially true in developed markets;
- the market does not value ESG strategies at all – investors perceive companies that have implemented ESG strategies as riskier.

However, current research does not show a statistically significant impact of implementing an ESG strategy on a company's market performance (Halbritter, Dorfleitner 2015; Naffa, Fain 2022). The literature has repeatedly examined the impact of implementing an ESG strategy on the value and growth potential of a company (Hong, Kacperczyk 2009; Perez Liston, Soydemir 2010). As summarised by De Souza Cunha *et al.* (2021) and Kumar *et al.* (2022), the nature of this impact is not homogeneous (Lins *et al.* 2017). Yu *et al.* (2018) and Wong *et al.* (2021) show external determinants related to the operation of a specific enterprise, i.e., the country in which the company operates (Besson *et al.* 2013) or the sector/industry to which it belongs (Adams, Jiang 2016) as reasons for this phenomenon. The research gaps indicated by Bajic & Yurtoglu (2018) highlight the impact that implementing an ESG strategy has on the value of the company in a group of companies from many countries does not clearly indicate in which countries such a relationship is statistically significant. Friede *et al.* (2015) pointed out that no comparison has been made between different company groups or companies from different sectors that would show the relationship with the ESG strategy in these groups.

On the other hand, Shanaev & Ghimire (2021) stated that future research should focus on whether any of the 3 components of ESG has a dominant impact on the market results achieved by a company implementing such a

strategy. The relationship between the growth of companies measured by EPS growth and the economic condition of the company measured with the z-score index from discriminatory models may reflect the critical moment of value creation depending on the assessment of the condition of the analysed company (Altman, Hotchkiss 2006).

The economic situation of a company should influence its growth. This influence can be positive or negative, and a good company situation can support higher growth; alternatively, a company in a bad situation can grow faster. This judgment depends on how the condition of a company is assessed. The Altman model can be used to assess the condition of the company since it is based on developed economies, such as the US; this assessment should be more accurate in a more developed country, such as Germany, rather than Poland (Balcaen, Ooghe 2006). On the other hand, when the economic situation is analysed together with the EPS growth of companies, this model can be more useful even in less developed markets (Danbolt *et al*. 2013). A company's economic condition can influence its growth, making it more or less intense. Company growth, referring to its value, is measured by the EPS growth.

3. Research methods and statistical data

The study was conducted on a group of nonfinancial companies listed on the WIG, included in the WIG index and WIG ESG index from 01/01/2013 to 31/12/2020. The analysed period covers 7 years. It begins in 2013, when the WIG changed its trading system from the old WERSET system to the new UTP system, which presented and reported the share prices of companies listed on the WIG in a slightly different way. In order to ensure the comparability of the results and comparability of the calculated growth rates (especially EPS), it was decided to start the analysis from 2013. On the other hand, the end of the research period was the beginning of the COVID-19 pandemic, which caused many market anomalies due to, among others, the lockdown. The outbreak of the COVID-19 pandemic had a very destabilising effect on the markets and the authors decided to omit this period, which significantly distorted the statistical significance of the results. Among the companies included in the WIG index, companies belonging to the logistics industry were distinguished. All companies in this industry apply an ESG policy. Due to the nature of their operations (i.e., warehousing and transport), companies that operate in the logistics industry significantly contribute to the generation of a carbon footprint. Operational CO_2 emissions are a major contributor to global warming. That is why the study focuses on companies in the logistics industry that include ESG policies in their development strategies.

The study was carried out with annual data. All data used came from the *Notoria* and *Bloomberg* databases. Prices have been adjusted for equity changes, such as preemptive rights, dividends, and splits. EPS is the factor that reflects corporate growth in terms of value maximisation; it is taken directly from the Bloomberg database as a continuous growth index calculated in terms of 3- and 5-years.

The analysis includes evaluations of 3- and 5-year EPS growth periods and an assessment of the condition of companies listed on the WIG index and WIG ESG index, presented as OLS and panel models parameter estimations. The cross-sectional OLS models are employed using Altman model scores as a logarithmic variable that is explained by the growth of the EPS index. The study was carried out using cross-sectional regression analysis and panel data. Several models were estimated using the OLS method with the inclusion of different sets of independent variables. The models were analysed in 2 versions depending on the EPS growth factors adopted as independent variables: M1 = with a 3-year EPS growth factor (EPS 3), M2 = with a 5-year EPS growth factor (EPS 5). Tests for the presence of fixed and random effects were also carried out (redundant fixed effects – Wald test, random effects – Breusch–Pagan test).

The model for the total sample is presented in equation:

$$EPS_n = a_{1t} + a_2 \cdot \ln AS_t + a_3 \cdot \ln D_t + a_4 \cdot ROA_t + e_t.$$

The cross-sectional OLS models utilised Altman model scores as a logarithmic variable, which is explained by the growth of the EPS index. The independent variables were not collinear because most of the VIF values were <5. The summary statistics of the variables used in the study are shown in Table 1.

Table 1. Summary statistics of all variables (source: the author's own elaboration)

	Mean	Median	SD
AS	7.5766	2.8844	30.1596
EPS 3	61.1533	0.0000	629.0071
EPS 5	165.7650	6.8928	1105.4380
D	2808.9004	458.3844	5767.6398
ROA	6.6731	4.1317	15.5636

As evident in Table 1, all the companies analysed were financially sound as measured by the Altman ratio and boasted a good ROA. As regards the increase in the value of the company in the 3- and 5-year periods, all the analysed companies showed quite high growth potential.

4. Results

The main purpose of this study is to verify whether discrimination models affect company growth, as expressed by the EPS indicator. In total, calculations of different model variants were carried out, taking into account all the variables concerning the 3- and 5-year growth indices. The model specification was also analysed using the RESET test, which indicated the correctness of the model (p-value > 0.05). The RESET test results obtained show that the specification of the variables in the model is correct.

Based on the methodology described above, the relationship between the EPS growth and the AS model, as well as control variables for the collected data, was 1st tested according to equation to obtain the results described in Table 2.

As shown in Table 2 and Figure 1, the z-Altman index has a positive effect on the 3-year growth of companies included in the WIG ESG index and companies from the logistics and transport industry; that is, the better the financial and economic condition of a company measured by the z-Altman index, the greater the growth that company can record. However, for companies from the WIG index, the z-Altman index is not statistically significant; perhaps this is due to the fact that in the entire WIG index, most companies do not apply a policy related to ESG, which significantly affects the results. The other control variables, i.e., the amount of D and the ROA, have a significant impact on 3-year growth measured by EPS growth for companies included in the WIG index and the WIG ESG index, as well as those in the logistics industry.

For 5-year growth shown in Figure 2, measured by the increase in EPS, the z-Altman index is statistically significant only for companies in the logistics industry. For other companies in the WIG index and the WIG ESG index, the z-Altman index is not significant for 5-year growth. The other control variables, i.e., the amount of D and the ROA, have a significant impact on 5-year growth measured by EPS growth for companies included in the WIG index, the WIG ESG index, and companies in the logistics industry.

Tests for the presence of fixed and random effects were then carried out (redundant fixed effects – Wald test, random effects – Breusch–Pagan test). Cross-sectional regression analysis was performed by estimating models with fixed and random effects for various combinations of the effects. As the models with random effects did not produce statistically significant results, only models with fixed effects were further analysed.

Table 3 presents the results of estimating model parameters from equation using the panel method with fixed effects.

As shown in Table 3, the results for 3-year growth, measured by the increase in EPS, were confirmed in the initial estimation using the OLS method. As before, the z-Altman index positively affects the 3-year growth of companies included in the WIG ESG index and companies in the logistics and transport industry, therefore for the 3-year period the hypotheses put forward at the beginning of the study (H1 and H2) can be positively verified.

Table 2. Estimation of the model parameters from equation using the OLS method (source: author's own elaboration)

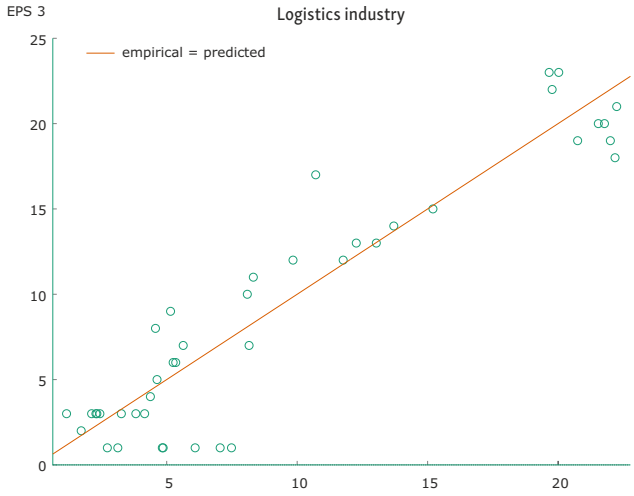
	Logistics industry	WIG ESG	WIG
Dependent variable: EPS 3			
Constant	11.2357***	−45.3366***	126.974***
ln(*AS*)	3.0543***	4.6858**	–2.4392
ln(*D*)	–1.8607***	4.3519***	–5.5345***
ROA	0.3902***	0.5890***	0.3012***
R^2	0.9563	0.8130	0.3956
Dependent variable: EPS 5			
Constant	–0.0203	−8.8363	42.1258***
ln(*AS*)	1.8381***	–0.420	3.62132
ln(*D*)	–0.4802***	1.3027*	1.0067*
ROA	0.3137***	0.4278***	0.2522***
R^2	0.9588	0.6034	0.4028

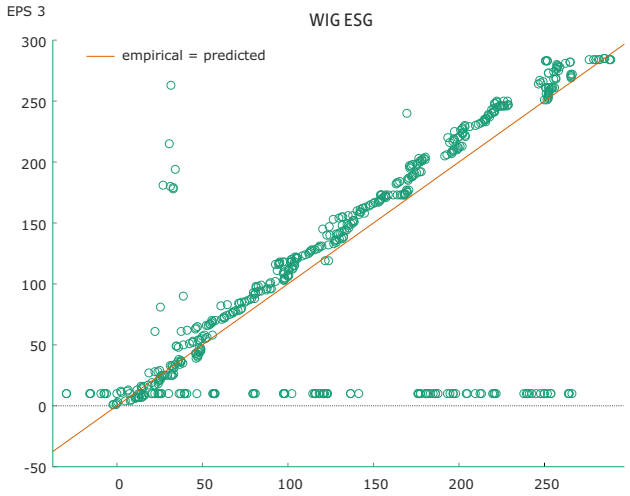
Note: *, **, *** – ratios are significant at 10, 5, 1%, respectively.

Table 3. Estimation of model parameters from equation using the panel method with fixed effects (source: author's own elaboration)

	Logistics industry	WIG ESG	WIG
Dependent variable: EPS 3			
Constant	12.3312***	–81.2921***	276.723***
ln(*AS*)	1.5128**	11.5179***	10.6429
ln(*D*)	–1.81788***	14.9487***	–18.0443***
ROA	0.3471***	0.3705***	0.2162***
Dependent variable: EPS 5			
Constant	–0.0475	–34.7602**	69.8647**
ln(*AS*)	2.7584	0.6329	0.1098
ln(*D*)	–0.5017*	9.7561***	13.4944***
ROA	0.3248***	0.2447***	0.1783***

Note: *, **, *** – ratios are significant at 10, 5, 1%, respectively.





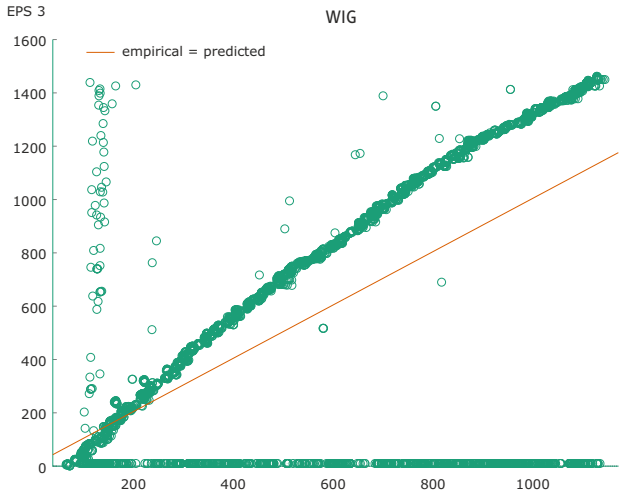
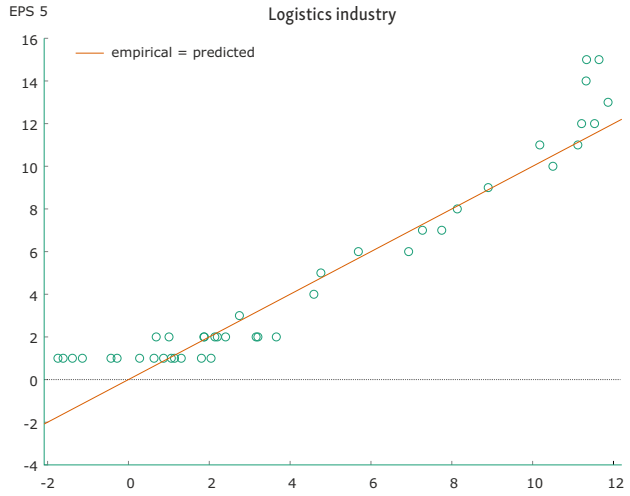
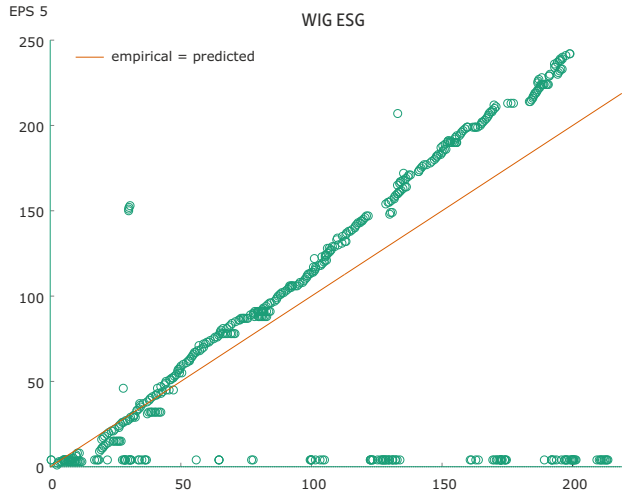


Figure 1. Fitting the model to real data for dependent variable EPS 3 (source: author's own elaboration)





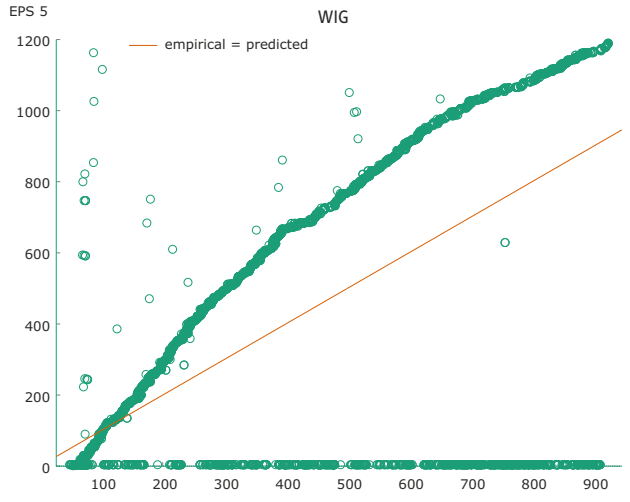


Figure 2. Fitting the model to real data for dependent variable EPS 5 (source: author's own elaboration)

However, for companies from the WIG index, the z-Altman index is not statistically significant. The other control variables, i.e., the amount of D and the ROA, have a significant impact on 3-year growth measured by EPS growth for companies included in the WIG index, the WIG ESG index, and companies in the logistics and transport sector, therefore the hypotheses put forward at the beginning of the study (H1 and H2) can be positively verified for the 3-year period.

In the case of 5-year growth, measured by the increase in EPS, the z-Altman index is not statistically significant for any of the cases analysed, which confirms the results obtained during the 1st estimate using the OLS method, therefore for the 5-year period the hypotheses (H1 and H2) cannot be positively verified. The other control variables, i.e., the amount of D and the ROA, have a significant impact on 5-year growth measured by EPS growth for companies included in the WIG index, the WIG ESG index, and those in the logistics and transport sector.

5. Conclusions

The popularity of measuring ESG performance has grown exponentially in recent years, especially in relation to listed companies, thus supporting investors' investment decisions. The research expands the knowledge of the interaction between the implementation of ESG strategies in logistics companies listed on stock exchanges and their growth. This pioneering research demonstrates that having an ESG strategy in place has a positive impact on the growth of logistics companies. The results are similar to Uyar *et al.* (2020), who investigated the relationship between CSR performance and reporting of CSR practices in the logistics sector. They found that companies with greater CSR performance are more likely to publish a CSR report.

On the other hand, the results contradict studies that demonstrated that sustainability performance has no positive effect on the value of logistics sector companies (Govindan *et al.* 2021). As the research showed, the implementation of ESG strategies in the logistics industry is considered in a short 3-year perspective. This results from the characteristics of the logistics market, which is flexible and based on strategies that minimise investment risk. It follows that the implementation of activities that focus on sustainable development and CSR in these enterprises is planned in the short term.

The analysis found that the z-Altman index has a positive effect on company growth in a 3-year period for companies from the logistics industry and all companies included in the WIG ESG index. In other words, the better the financial and economic condition of a company measured by a high z-Altman index, the greater the growth that company can record. These results were also confirmed in panel studies with fixed effects, which allows us to conclude that these were not random results. Regarding company growth over a longer 5-year period, the influence of the z-Altman index was not observed. Perhaps this is due to the fact that in the Polish capital market, which is still classified as a developing market, the application of an ESG-related policy is only being implemented in some companies. Therefore, the results for companies included in the WIG index show that for the growth of the company in both 3- and 5-year periods, the financial and economic condition of a company, measured by the z-Altman index, has no impact on the size of this growth, which was also confirmed by panel models.

However, the research also has limitations. 1st, the results of the study do not take into account the size of logistics companies listed on the WIG, which is an important factor that differentiates the development strategies of enterprises (Liu *et al.* 2020). The authors agree that large-scale and listed logistics companies are eager to develop their own ESG capabilities, reporting, and measurement (Tsang *et al.* 2023).

Therefore, further research could be combined with the analysis of companies from different countries (developed and developing countries) to ascertain in which group the implementation of an ESG strategy will affect the growth or growth potential of the company. The authors also plan to thoroughly examine the impact of the size of logistics companies with ESG strategies on their growth, taking into account the maturity of the logistics market.

Disclosure statement

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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