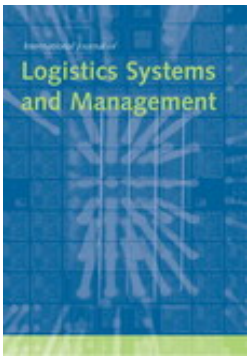

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Being green as an instrument for increasing firm value: case of US transport and logistics companies

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Being green as an instrument for increasing firm value: case of US transport and logistics companies

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Abstract: The article investigates the factors that affect the corporate value (Tobin's Q) of 57 US logistics companies. The research considers financial indicators such as ROI, ROTE, P/E ratio, company's operating efficiency, financial leverage, EPS and net income suggestive of a firm's earning capacity and a non-financial dummy variable 'green' which indicates whether a particular logistics company implements green practices and technologies in its operations. The results of the research indicate that there is a positive and significant relationship between Tobin's Q and P/E ratio, ROA and a green indicator. A negative and significant relationship was found between Tobin's Q and ROI and EPS. Also, the article investigated individual interaction effects with the 'green' variable and other financial indicators. The results indicate a negative and significant relationship between Tobin's Q and value of ROTE and EPS of green logistics companies.

Keywords: green logistics; firm value; sustainable logistics; environment.

JEL codes: G32, C01, Q01.

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1 Introduction

The current global challenges have significantly affected businesses and their operations worldwide. Company owners and investors cannot rely solely on financial value for business valuation anymore (Wong et al., 2021). Considering the greater emphasis on sustainability issues by numerous communities around the world, the value of a business is now seen as a combination of its financial value and societal and environmental impact (Serban et al., 2022). Thus, it seems reasonable to assume that the extent to which a company is engaged in green operations is closely linked with the company's reputation. Consequently, 'green companies' might be considered more attractive for an investor clientele that values long-term investments and the environment (Govindan et al., 2021).

In the present work, we will take a closer look at green and non-green logistic companies operating in the USA and listed at the US stock market. The paper considers logistics and transportation companies since sustainability issues are relevant to these industries. Being engaged in transit operations, these companies are responsible for large-scale air pollution, especially in case of airlines. Therefore, there are several airlines among the companies analysed in this paper. Moreover, all companies are large enterprises, and therefore exert the most significant influence on the surrounding climate and environment. Given the previous statements, it is plausible for green logistics companies to outperform non-green companies in terms of firm value. The above-mentioned circumstances substantiate the relevance of the paper.

2 Literature review

2.1 Previous empirical studies

The problem stated in the paper considers sustainable transformation of companies and a new way of value creation. A combination of environmental, societal and financial value generated by green companies has been mentioned in numerous studies in the previous years (Serafeim and Amel-Zadeh, 2018). During operational activities, the company has a social obligation to the surrounding environment, popularly known as corporate social responsibility (CSR). Howard R. Bowen first proposed this idea in a 1953 book entitled

Social Responsibilities of the Businessman to mean a corporate obligation towards societal values. The greater investor appetite for green companies and their long-term perspectives were addressed by Dimson et al. (2015). Moreover, in support of the above-mentioned studies, Flammer (2020) and Guenster et al. (2011) indicate that greater investor appetite for the company's stocks might lead to a boost in its overall value and higher esteem from a stock market perspective. Another document in support of sustainable investing was presented by BlackRock in 2018. The report represents results derived from a globally representative set of three sustainable indices whose performance was analysed against their non-sustainable benchmarks back to 2015. According to the document, companies with environmental, social, and governance (ESG) profiles are less prone to decrease in stock price in the future. This implication is valid across sectors. Another implication is that the implementation of ESG practices is conducive to operational performance. Thus, the firm value is higher for sustainable companies along with the efficiency of equity and asset management as measured by ROE and ROA. Serban et al. (2022) found a direct link between the ESG score and value-added variables and market capitalisation.

As the global economy integrates countries across the world, the paradigm shift from manufacturing to assembling has emphasised the importance of logistics. As documented by the IEA in 2019, one-fourth of the total CO_2 emissions come from road transports, and the rate of emissions is predicted to be rising. According to the exemptions from the International Transport Forum (2019), by 2050, the demand for freight transport will have tripled. Thus, the greening of logistics systems is required, and making transport operations more environmentally friendly has become a crucial aspect of the transport industry in its attempt to prevent climate change and air pollution. An opportunity to shift to alternative transport modes or fuel alternatives may be conducive to the reduction of the environmental impact of logistics companies (Johansson, 2020). In the era of cooperative business by assembling, businesses function with many partners. Thus, logistics is widely used to describe integrated practice among networks of transportation, storage, and product handling as they move from the material source through the supply chain system to the final point of sale or consumption, which is the key determinant of business performance (Choi, 2011). By placing more emphasis on environmental management, enterprises may reduce costs and increase revenues (Ambec and Lanoie, 2008). In the modern literature, this phenomenon is called green logistics.

The greening of logistics systems has become a priority for those who operate and find themselves within a supply chain (Simm, 2021). One of the reasons is that the environmental aspects are related to the economic objectives in the logistics sector (Martins et al., 2020). There is evidence that sustainable logistics practices have a large influence on environmental reputation and financial performance (Baah et al., 2021). The modern industrial enterprises are under pressure from the emerging yet competitive green logistics market, society and governmental regulators to develop a balance between social, environmental and economic performance (Afonso and Silva, 2019). Those companies which succeeded in finding this balance acquired a competitive advantage over other rivals in the market (Darwish et al., 2021). The logistics sector is extremely successful in communicating its CSR performance in terms of CSR initiatives. This verification corroborates the trustworthiness of the sector (Uyar et al., 2020). Undeniably, implementing environmental management systems while meeting the purpose of improved economic performance and providing positive environmental and social impact is a challenge, although rewarding. In particular, implementing and spreading green

logistics practices is positively correlated with the economic growth of the countries studied (Li et al., 2021; Magazzino et al., 2021). In the same manner, Hanif et al. (2020) found empirical evidence based on Pakistan's data that logistic industrial development is comparatively quicker in the geographical areas where economic growth is higher than those areas where economic growth is low.

In most cases, green supply chain practices (GSCM) have a positive and significant effect on the performance of logistics companies. This implication is supported by Rusmawati and Soewarno (2021), who state that GSCM practices have a positive and significant effect on environmental performance (EP) and green economic performance (GEP). The study also found that the role of green technology as a moderating variable can strengthen the positive relationship between GSCM practices and EP. GSCM is the strategic integration and achievement of the corporate social environment. It involves the systematic coordination of business processes between key organisations to improve the long-term economic performance of individual companies and their supply chains (Zhu et al., 2013; Cousins et al., 2019). In other research, GSCM practices are also associated with reduced costs (economic performance) (Cousins et al., 2019) such as waste management, use of cheaper recycled raw materials, efficient energy consumption, minimisation of environmental accidents, and several components in products and pollution prevention, which limits the costs of compliance with environmental regulations and green operational costs (GEP) (Çankaya and Sezen, 2019; Mehdikhani and Valmohammadi, 2019). Another article in support of the above-mentioned idea was published in 2021 by Khaleeli et al. The research explored the possible impact of green marketing, green supply chain and green human resources on the business performance of 113 companies in the logistics industry of UAE. The findings indicate that green marketing was the major determinant of customer performance, green human resources was the major factor affecting learning and growth, and that green supply chain was the main influencer of financial performance and internal processes. Similarly, Laguir et al. (2021) revealed that EP is positively influenced by both eco-efficiency and eco-branding orientations.

Other studies, however, conclude that environmental practices and initiatives involve higher costs and fewer benefits, and they may even create a negative relationship between environmental management and business performance (Cordeiro and Tewari, 2015; Link and Naveh, 2006; Choi et al., 2010). For example, the results of a survey of 274 managers of manufacturing firms in Ghana indicated that GLMPS positively influences social sustainability and environmental sustainability, but negatively influences business performance (Agyabeng-Mensah et al., 2020).

The present article will address the impact of green technologies and green operations implementation on the business value from the market's point of view. In this context, Tobin's Q (Q ratio) will be used as an indicator of investors' attitude towards different companies and their long-term value (Flammer, 2019; Li et al., 2019). According to Copeland and Weston (2008), the measurement of a company's value using Tobin's Q ratio compares the market value of a company listed in the financial market with the value of the replacement of company assets. According to Salvatore (2005), the aim of the company is to maximise the wealth or value of the company, which in this paper will be represented by the Tobin's Q. Based on the example of a 18-year analysis of copious US companies, Eccles et al. (2014) concluded that highly sustainable firms outperform their competitors with lower ESG ratings on the stock market. The abnormal returns are higher for the former by 4,8%, which is statistically significant. Accounting performance

(ROA and ROI) was evinced to be higher for the sustainable companies as well. However, the inverse relation was found by Landi and Sciarelli (2018). The fixed effect model developed by the authors derived ambiguous results. On the one hand, the model indicated a growing interest on the part of investors and managers in corporate responsibility in Italy. Due to the spread of the concept among different market participants, the quality of the CSR assessment has increased. In the meantime, the results also suggest that by applying ESG criteria to their stocks, companies do not enjoy abnormal returns, which indicates a negative relationship between ESG factors implementation and the market premium on the Italian stock market. Therefore, the study rejects the hypothesis about the value enhancing effect of greening. Similarly, Baron and Diermeier (2018) documented a negative relationship between CSR and shareholder's value. However, Freise and Seuring (2015) consider CSR a risk-management tool and an indicator of responsible management, aiming to prevent negative events in the future. CSR also contributes to building trust and accrues a company's goodwill. Therefore, Fombrun et al. (2000) see a positive association between CSR and corporate value. Moreover, the authors suggest that the effect is likely to be more severe for companies belonging to oil and gas, mining and logistics industries as their operations are highly influential in terms of impact on climate. The valuation implications are also the strongest for larger firms.

The Q ratio also helps understand whether a company is under- or overvalued by the market. The core idea is to break down the Tobin's Q of various companies to several influential factors within one regression model. Previous studies on the indicators affecting a company's Tobin's Q were conducted by Astuti et al. in 2019. According to the paper, the result of testing with firm value (Tobin's Q) as the dependent variable indicates that firm size, institutional ownership, and profitability (ROA) have no effect on firm value (Tobin's Q). In 'Effect of CSR disclosure to value of the firm: study for banking industry in Indonesia', Tjia and Setiawati (2012) show that CSRD has no significant effect on firm value using simple regression analysis method. Meanwhile, Sitorus et al. (2013) shows that CSRD has significant effect on company value using multiple regression analysis and analysis path method. The previous studies suggest that green bonds issuance significantly contributes to a company's financial performance and long-term value (Flammer, 2019). Konar et al. (2001) consider the impact of EP on the company's Tobin's Q as a measure of value. The authors claim that a value of a company with zero intangible assets is equal to the overall value of its tangible assets, and therefore Tobin's Q is equal to 1. However, if the value of intangible assets grows, the value of the Tobin's exceeds 1. They document a positive relation between EP and the market value of a company. As a part of intangible assets, the market value of a company affects a company's Tobin's Q, which indicates that a market perceives and estimates the environmental actions of firms. In support of this result, we may refer to earlier works, which state the contemporaneous negative effect of environmental mishaps in the company on its stock price. Klassen and McLaughlin (1996) found significant negative abnormal returns when firms had bad environmental news such as oil spills, and positive returns when firms received environmental awards.

2.2 Selection of variables and hypotheses

In this article, we will examine whether factors such as return on investments, return on equity, return on assets, return on tangible equity, earnings per share, financial leverage,

price-to-earnings ratio, net income, and a dummy variable 'green' (as independent variables) affect the mean of Tobin's Q (taken as the dependent variable). We will also take a closer look at the common patterns observed in different companies which may cause increase or decrease in the company's value. The next step is to analyse which of the independent variables (factors) presumably affecting a company's Tobin's Q simultaneously capture the quantitative changes occurring in a company after the introduction of 'green technologies' or conversion into a 'green company'. To accept or prove wrong the hypothesis that the implementation of green technologies may improve investor's attitude towards a company, the comparison between non-green and green companies will be provided and based on the Tobin's Q and the independent factors affecting it.

Before putting forward any hypothesis, it is worth explaining why these variables have been taken as the basis for the regression model for Tobin's Q estimations. Here, it is worth mentioning that Tobin's Q close to 1 signals the fair value of a company as seen from the viewpoint of the market. If Tobin's Q is less than 1, then a company's assets cost more than the company's shares outstanding, which serves as a signal of future potential growth in the company's stock price and enterprise value, accordingly. It also means that the company's assets can generate additional value, and when this information is transferred to the market, the stock price increases. An inverse picture is seen when the Tobin's Q is higher than 1. This means that a company is overvalued by the investors.

1 Dummy variable 'green': a newly introduced variable, serving for the detection of the relationship between Tobin's Q increase and a company's affiliation to 'green' companies. It is taken to be 1 and 0 for green and non-green companies, respectively.

   H1 Green companies seem to be more valuable for the investors in the long run (positive relationship between Tobin's Q and 'being green'). In other words, green logistics companies have a higher predisposition to future growth, as captured by the value of the Tobin's Q. This conclusion is based on the previous articles of Flammer (2015) and Choi et al. (2010), which also demonstrated a positive result.

2 Return on investment is a performance measure used to evaluate the efficiency of an investment or compare the efficiency of several different investments. Therefore, ROI suggests the company's ability to earn money on the investments made, which is an indicator of the future growth of the overall value in the long term (Flammer, 2019; BlackRock, 2018).

   H2 ROI is influential to the Tobin's Q (positive relationship).

3 Return on assets: given the earnings capacity of the tangible assets in this paper, we may assume that the Tangible Equity of the company is a value-enhancing component as it contributes to the cohesive functioning of a firm. Since a similar hypothesis has never been tested before, we consider it a possible novelty of our research.

   H3 Return on assets has a positive relationship with Tobin's Q.

4 Financial leverage is a ratio indicating the extent to which a company finances its operations itself and by borrowed means. In terms of value creation, financial leverage serves as an indicator of the company's liquidity and, therefore, risk. Hence, we may assume a negative relationship between value creation and financial

leverage. However, Financial Leverage also signals access to the money. In this case, we may assume that green companies have a higher leverage than non-green ones. This nexus was investigated by Tjia and Setiawati (2012) with negative results, whereas Flammer (2015) received a neutral result (zero connection). Therefore, following the logic above, we would test the former.

H4 The financial leverage has a negative relationship with Tobin's Q.

5 The price-to-earnings ratio (P/E ratio) measures a company's current share price relative to its per-share earnings (EPS). A high P/E ratio could mean that a company's stock is over-valued or that investors are expecting high growth rates in the future. This also indicates potential growth of the company's stocks as observed by the market. In the present paper, we assume that green companies have higher P/E ratio since they have more opportunities for future development. As has been previously suggested by Flammer (2019), the P/E ratio is positively influenced by the ESG factor of companies. Therefore, we test this hypothesis in our research as well.

H5 The price-to-Earnings ratio positively influences Tobin's Q.

6 Within the existing paper, net income suggests the firm size since the value of net income depends on the company's assets and scale of operations. Since a similar hypothesis has never been tested before, we consider it a possible novelty of our research.

H6 Net income positively influences Tobin's Q.

7 Earnings per share is calculated as a company's profit divided by the outstanding shares of its common stock. The resulting number serves as an indicator of a company's profitability. A higher EPS indicates greater value because investors will pay more for a company's shares if they think the company has higher profits relative to its share price. Since a similar hypothesis has never been tested before, we consider it a possible novelty of our research. Therefore, we may derive the Hypothesis 7.

H7 There is a positive relation between Tobin's Q and an indicator of EPS.

8 Return on tangible equity is another indicator defining the earning capacity of the tangible part of the company's means. However, it is possible to precisely measure the value of tangible equity, and therefore, ROTE does not tell investors anything about the company's ability to earn super-profits. Since a similar hypothesis has never been tested before, we consider it a possible novelty of our research. Thus, the H8 will be formulated as follows:

H8 There is a negative link between Tobin's Q and a return on tangible equity.

2.3 Materials and methods

The study uses data from sources Investing.com (2020) and Macrotrends (2020). We consider the data for 57 logistic companies operating in the USA and listed on the US stock market. Its data covers the 2011–2020 period.

The study employs factors that influence firms' performance on the stock market commonly utilised in the previous literature and additional indicators suggested by the authors of the present research. Therefore, the dependent variable is the Tobin's Q, while the independent variables are eight selected factors. The variables, their measurements and supporting studies used in this study are listed in the Table 1.

Table 1 Variables in model

Variables	*Measurements*	*Supporting studies*
Independent (y)		
Tobin's Q	Unitless; proportion	Flammer (2019)
Dependent (x)		
ROI	%	Flammer (2019) and BlackRock (2018)
ROA	%	Astuti et al. (2019)
ROTE	%	is tested
Financial leverage	Unitless; proportion	Tjia and Setiawati (2012)
P/E ratio	Unitless; proportion	Flammer (2019)
Net income	mUSD	is tested
Green policy (dummy variable)	-	Cordeiro and Tewari (2015), Link and Naveh (2006), Flammer (2019) and Khaleeli et al. (2021)
EPS	Dollars	is tested

Pooled ordinary least squares regression was used to analyse the data to obtain the results. In our model, we consider cases where the companies are profitable; hence, we set the following limits in the models below: positive financial leverage, net income, and earnings per share. Also, to establish a general trend, the value of Tobin's Q and return on investments was limited to 10 and 3, respectively. Therefore, this study consists of 421 observations. The first model does not include the interaction effects between Green Policy and other explanatory variables. Models 2 to 8 contain interaction effects between green policy and other explanatory variables. This is made to test whether the operational results of green companies are related to the values of the Tobin's Q. In addition, we have taken Tobin's Q and P/E ratio under natural log in order to ensure linearity in the model.

3 Results

This study focuses on the following variables: return on investments, return on assets, return on tangible equity, earnings per share, financial leverage, price-to-earnings ratio and net income suggesting a firm's size. For each of the indicators we have defined the proposed relationship with company's Tobin's Q, basing on the literature review and our own assumptions. The result of the research is provided in Table 2.

Table 2 presents the descriptive statistics for the sample. It shows such characteristics as mean value, standard deviation and the maximum and minimum values of the whole dataset for this study.

Table 2 Descriptive statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
Tobin's Q	421	1.19	0.99	0.02	5.31
Financial leverage	421	2.84	6.97	0.01	87.95
EPS	421	3.11	3.79	0.02	39.85
P/E ratio	421	22.11	29.57	0	321.07
ROA	421	0.07	0.05	–0.13	0.21
ROTE	421	0.19	1.02	–10.79	6.78
ROI	421	0.11	0.09	–0.29	0.74
Net income	421	650.58	1,274.76	0.26	10,712
Ln (Tobin's Q)	421	–0.15	0.86	–4.19	1.67
Ln (P/E ratio)	421	2.68	1.23	–6.91	5.77

Table 3 Correlation table

	Ln (Tobin's Q)	*Net income*	*ROI*	*ROTE*	*Ln (P/E ratio)*	*ROA*	*EPS*	*Financial leverage*
Ln (Tobin's Q)	1.00							
Net income	0.20*	1.00						
ROI	0.01	–0.00	1.00					
ROTE	–0.27*	–0.03	0.36*	1.00				
Ln (P/E ratio)	0.12	0.14*	–0.11	0.03	1.00			
ROA	–0.32*	0.06	–0.18*	0.68*	0.21*	1.00		
EPS	–0.12*	0.06	0.02	0.01	0.23*	0.08	1.00	
Financial leverage	0.01	–0.10	–0.37*	–0.05	0.12	0.14*	–0.01	1.00

Note: The stars are depicted the interval of p-value (***p < 0.01, **p < 0.05, *p < 0.1).

Figure 1 Marginsplot of interaction 'green' with net income (see online version for colours)

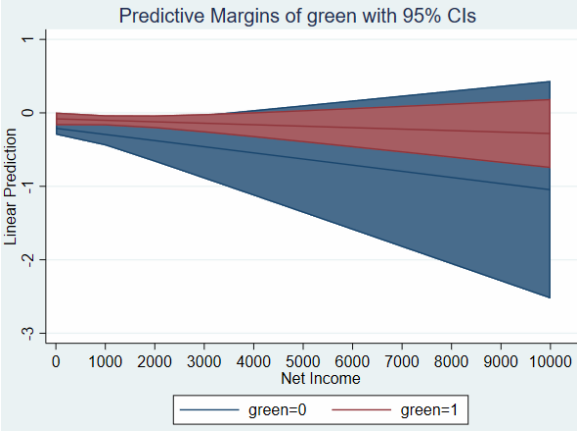


Table 4 Results of the regression modelling

Models / *Parameters*	*ols1*	*ols2*	*ols3*	*ols4*	*ols5*	*ols6*	*ols7*	*ols8*
	b/se	*b/se*	*b/se*	*b/se*	*b/se*	*b/se*	*b/se*	*b/se*
Net income	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	0.000	–0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROI	–1.490*	–1.476*	–0.938	–1.526*	–1.543*	–1.602*	–1.543*	–1.574*
	(0.706)	(0.707)	(0.853)	(0.703)	(0.706)	(0.707)	(0.703)	(0.716)
ROTE	0.024	0.013	0.025	0.098*	0.022	0.025	0.035	0.021
	(0.028)	(0.031)	(0.028)	(0.043)	(0.028)	(0.027)	(0.028)	(0.028)
Ln (P/E ratio)	0.182***	0.182***	0.180***	0.179***	0.216***	0.179***	0.183***	0.182***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.033)	(0.022)	(0.022)	(0.022)
ROA	15.583***	15.592***	15.374***	15.564***	15.591***	16.868***	15.793***	15.672***
	(1.270)	(1.271)	(1.283)	(1.264)	(1.269)	(1.467)	(1.268)	(1.277)
EPS	–0.025**	–0.025**	–0.025**	–0.025**	–0.024**	–0.026**	–0.018*	–0.025**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)
Financial leverage	–0.001	–0.001	0.001	–0.001	–0.000	–0.001	–0.000	–0.014
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.019)
Green policy	0.143*	0.129*	0.224*	0.158**	0.310*	0.279**	0.242**	0.111
	(0.060)	(0.062)	(0.092)	(0.060)	(0.134)	(0.098)	(0.075)	(0.074)

Note: The stars are depicted the interval of p-value (***p < 0.01, **p < 0.05, *p < 0.1).

Table 4 Results of the regression modelling (continued)

Models / *Parameters*	*ols1*	*ols2*	*ols3*	*ols4*	*ols5*	*ols6*	*ols7*	*ols8*
	b/se	*b/se*	*b/se*	*b/se*	*b/se*	*b/se*	*b/se*	*b/se*
Interactions with 'green'								
Green policy # Net income		0.000 (0.000)						
Green policy # ROI			–0.807 (0.701)					
Green policy # ROTE				–0.121* (0.055)				
Green policy # Ln (P/E ratio)					–0.062 (0.045)			
Green policy # ROA						–2.116 (1.215)		
Green policy # EPS							–0.040*(0.018)	
Green policy # Financial leverage								0.014 (0.019)
Constant term	–1.502*** (0.083)	–1.494*** (0.084)	–1.538*** (0.089)	–1.501*** (0.083)	–1.588*** (0.104)	–1.565*** (0.091)	–1.543*** (0.085)	–1.471*** (0.093)
Model characteristics								
N	421	421	421	421	421	421	421	421
Adusted R^2	0.585	0.585	0.585	0.589	0.586	0.587	0.589	0.585
Root MSE	0.556	0.556	0.556	0.553	0.555	0.555	0.554	0.556

Note: The stars are depicted the interval of p-value (***$p < 0.01$, **$p < 0.05$, *$p < 0.1$).

Figure 2 Marginsplot of interaction 'green' with ROI (see online version for colours)

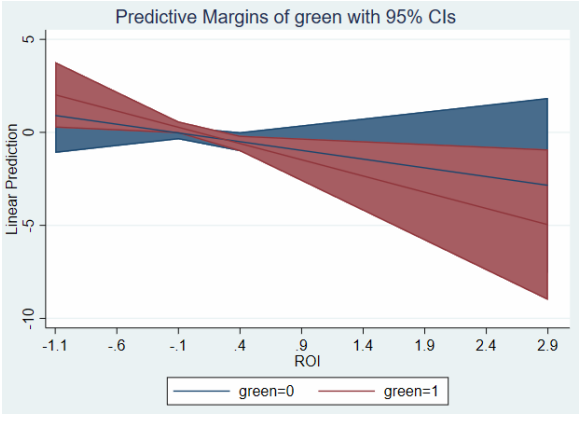


Figure 3 Marginsplot of interaction 'green' with ROTE (see online version for colours)

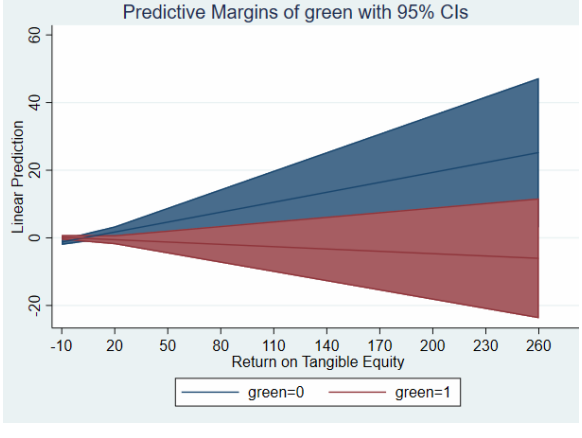


Figure 4 Marginsplot of interaction 'green' with P/E ratio (see online version for colours)

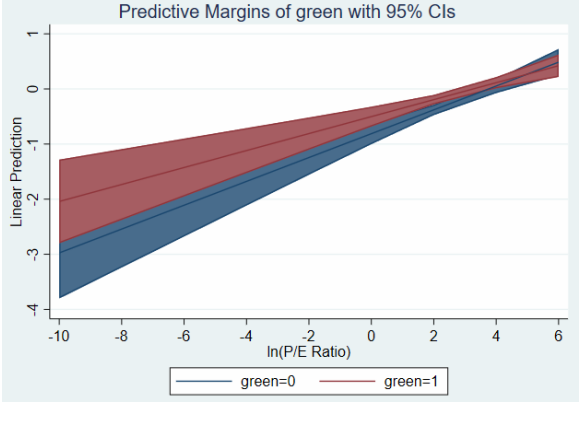


Figure 5 Marginsplot of interaction 'green' with ROA (see online version for colours)

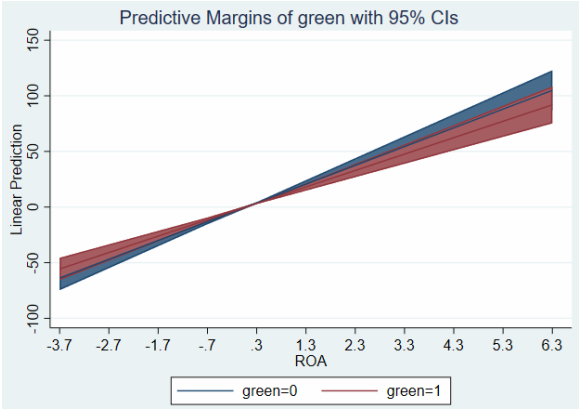


Figure 6 Marginsplot of interaction 'green' with EPS (see online version for colours)

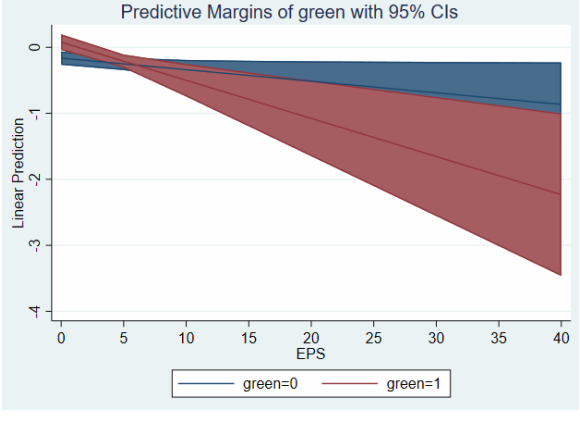
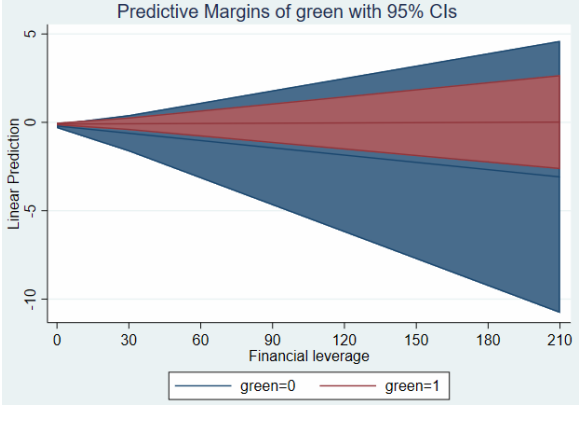


Figure 7 Marginsplot of interaction 'green' with financial leverage (see online version for colours)



In order to see if there are any connections between the presented variables, a Pearson's correlation matrix was built. The results are presented in the Table 3. Table 4 presents the results of the regression modelling for the Tobin's Q [models (1)–(8)]. Models 2 to 8 capture the interactions of the dummy variable 'green' with other variables in the model. The interactions are given in order to demonstrate to what extent the influence of regressors in the model on the Tobin's Q for 'green companies' differs from the same influence on Tobin's Q for conventional companies. Thus, we would like to know whether the market value of a company becomes more significant for green logistics companies due to the changes in indicators such as net income, ROI, return on tangible equity, ROA, earnings-per-share, value of financial leverage and P/E ratio. In the present model, only interactions with return on the tangible equity and earnings-per-share are statistically significant with a 95% confidence level. Therefore, 'green' logistics companies with a lower return on tangible equity and earnings-per-share will have a higher value of Tobin's Q, based on the regression model. Eventually, we can conclude that the market evaluates 'green' companies as higher than companies which not provide green policy despite low EPS and return tangible equity. It can also be seen in Figures 1–7, where the marginsplots of the described interactions are presented. Since no literature suggesting such interaction was found, we claim that the obtained result adds novelty to our research.

4 Discussion

The results of the research allow us to conclude the following.

Return on investment

As suggested by the previous research of Flammer (2019), ROI had a positive impact on the Tobin's Q of the companies. Furthermore, Eccles et al. (2014) concluded that highly sustainable firms outperform their competitors with lower ESG ratings on the stock market. Accounting performance (ROA and ROI) was evinced to be higher for the sustainable companies as well. However, it should be mentioned that all the considered companies are green bonds issuers. In the current research, we investigate companies which are labelled 'green' but are not green bonds issuers. In the present article, we state a negative relationship between the ROI of green logistics companies. The obtained result may be explained by the fact that the yearly indicators of ROI were considered. In the given articles, the authors considered the ROIs of longer timespans, when the money invested in green technologies gave monetary returns, as captured in the financial reports of the observed companies. In our research, we only considered short-term returns on investments measured within a year. As green technologies are a long-term investment, the indicators used in the present research may not demonstrate the full monetary effect of their implementation. Therefore, the present model outlines a negative relationship between Tobin's Q and ROI. So, the amount of money invested by a company in the development projects does not enhance the corporate value since the returns are not observable in a short run. Therefore, we may claim that our result contradicts the results of earlier research. H2, ROI is influential to the Tobin's Q (positive relationship), was rejected.

Return on asset

As suggested by the previous research of Flammer (2019) and Serafeim and Amel-Zadeh (2018), ROA evinced a positive impact on the Tobin's Q of the companies. Moreover, according to BlackRock (2018), the firm's value is higher for sustainable companies along with the efficiency of equity and asset management measured by ROE and ROA. In the final regression model, there is a positive relationship between Tobin's Q and ROA. The relationship seems logically convincing since ROA is not a monetary representation of the company's assets (as in the case of Intangible Assets, for instance), but it represents the return which potential investors may enjoy if they have invested in the company. ROA indicates the efficiency of a company's operations and successful asset management. Therefore, companies with higher ROA are considered more attractive by investors, with higher stock prices stemming from the growing demand on such securities. We may claim that in general our result falls in line with the results derived by earlier research. H3, ROA has a positive relationship with Tobin's Q, was accepted.

Financial leverage

As suggested by the previous research of Tjia and Setiawati (2012) and Flammer (2019), financial leverage has no effect on the Tobin's Q. However, in terms of the current research, we decided to investigate this relationship as well. We arrived at the same result and therefore did not include Financial Leverage in the final regression model due to its insignificance. H5, Financial Leverage has a negative relationship with Tobin's Q, was rejected, which falls in line with the previously published articles.

Price-to-earnings ratio

As suggested by the previous research of Flammer (2019), the P/E ratio had a positive impact on the Tobin's Q of the companies. Since the green label positively affects the stock price as suggested by the previous research, then the P/E ratio enhances the value of Tobin's Q. The higher the P (stock price), the higher the market value. We may claim that in general our result falls in line with the results derived by earlier research. H6, price-to-earnings ratio positively influences Tobin's Q, was therefore accepted.

Net income

As suggested by the conducted analysis, the net income was not included in the final regression model due to its insignificance in terms of the model. We may now claim that the net income obtained during a year is not seen by investors as a guarantee of the company's future growth and therefore does not enhance its value. Having found no literature suggesting any relationship between Tobin's Q and net income, we rejected the hypothesis H7 that net income positively influences Tobin's Q. This implication also forms the novelty of current research.

Dummy variable 'green'

Previous research by Flammer (2019) and Khaleeli et al. (2021) suggest that there is a positive relation between the company's value from the viewpoint of an investor and the green label of the company. However, several other researchers working in the territory of China (Choi et al., 2010) suggested a negative relationship between green operations and a company's value due to high costs of the introduction of green operations. Therefore, our final regression model supports the former and contradicts to the latter research. H8, green companies seem to be more valuable for the investors in the long run (positive relationship between Tobin's Q and 'being green'), was accepted.

Earnings-per-share

As suggested by the conducted analysis, the EPS ratio has a negative impact on the Tobin's Q. Initially, we assumed a positive relation; however, the investigation led us to the opposite result. This could be because the EPS ratio also mirrors the company's profitability and its earning capacity. Therefore, by having a negative impact on the Tobin's Q, the EPS may move the mean of the company's value closer to the fair value, which is logically convincing. Having found no literature suggesting any relationship between Tobin's Q and earnings-per-share, we rejected the hypothesis H9 that there is a positive relation between Tobin's Q and an indicator of EPS. According to our results, the relationship is negative, and this adds novelty to the present research.

Return on tangible equity

As suggested by the results of our research, ROTE only has impact on the Tobin's Q for green logistic companies. Therefore, for the general sample, which includes non-green companies, return on tangible equity has no significant relationship with Tobin's Q. As we found no earlier literature suggesting such relationship, we may claim that this is a part of the novelty of the present research. The negative relationship may come from the fact that the tangible equity does not contribute to the creation of an excess profit, which would raise the investor's expectations regarding a company and thus boost the Tobin's Q through increased market capitalisation. Since the relationship is negative for the green companies, we may accept the H8 with an amendment that such a relationship only exists in green logistic companies.

5 Conclusions

In the current research, we have analysed the financial performance of several large logistics companies in the USA and estimated their connection with the company's value from the investor's point of view. Due to restricted access to the full database of the logistics companies operating in the USA, we have considered only the 57 largest companies listed at the US stock market. This means that the dataset does not capture the patterns of all companies in the logistics industry. However, given that the companies with the largest market shares have been taken into account, it is likely that the current paper mirrors the general picture of what is going on with green logistics companies' operating performance and value in comparison to those of non-green logistic companies.

We obtained a final OLS model suggesting a positive relationship between being green and the increase in corporate value captured by the Tobin's Q. The positive relationship between being 'green' and increase in the stock price clearly shows that investors are more optimistic about the stocks of green companies, which become more attractive on the stock market, thereby resulting in an increase in price.

We can also outline the positive relationship between the ROA and the Tobin's Q of the company. Therefore, companies with a higher ROA are considered more attractive by the investors, with higher stock prices stemming from the growing demand on such securities.

An inverse relation is seen between the Tobin's Q and EPS, which can be seen both as an indicator of the attractiveness of a company's stocks to the investors and as an indicator of a company's profitability. From the point of view of the company's owner, profitability stems from the assets and managerial skills of the staff. Therefore, EPS may outline a decline or increase in the fair value of a company, and not changes in merely its stock price. Therefore, there is a negative relationship between Tobin's Q and EPS as it deters the company from being overvalued by the market. The present model also states that ROI has a negative effect on the company's Tobin's Q.

The final parameter of the model is the Return on Tangible Equity, which is seen as an earning element in the company's equity and assets. The indicator is not statistically significant if we look at the final model, yet it is significant and negative if we consider the interaction between the variable 'green' and ROTE. Given this, we may claim that in case of increase in the return on tangible equity, a green company would receive a slight drop in its Tobin's Q.

Our article also supports the previous studies and outlines that being labelled as a green company may be conducive to the enhancement of the corporate value from the investor's point of view.

Overall, the obtained results supported several earlier articles concerning the relationship between a company's value and several financial indicators. The novelty of our research lies in the negative relationship observed between ROI and EPS on the Tobin's Q. We also established a zero-connection between Tobin's Q and net income. Moreover, we found out that the only significant interactions between the variables in the model and the dummy variable 'green' are with EPS and Return on Tangible Equity, which seems to be statistically insignificant in the model when we apply it to the whole pool of data and not just to the green logistic companies. This implies that a green label cannot be seen as merely a brand positioning; instead, this aspect together with the above-mentioned components can numerically influence the value of the Tobin's Q of green companies.

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