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Ethical, social and governance factors and their association with financial performance of firms in the transport industry

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1. Abstract

This paper researches the relation between ethical, social and governance (ESG) factors and financial measures of the 45 most popular firms in the transport industry as rated by Fortune. The financial measures researched are revenue, profit, enterprise value and total asset value. It is found that there is a negative correlation between ESG and revenue; however, the coefficient is very low that it is close to 0. Other financial performance indicators have no relationship with ESG. Therefore, in conclusion, there is no association between ESG and financial performance.

2. Introduction

2.1. Research Question

Climate change is an existential threat to all of humanity (Teaiwa 2019). With rising activists like Greta Thunberg, the current generation is taking the front lines to defend their future and advertise sustainable development. Therefore, there should be an increasing social pressure demanding more sustainable activities from organizations. In fact, some firms do spend a large budget on corporate social performance (CSP). Even taking an example from a naturally polluting industry such as the transport industry, it shows that some firms place a high priority on CSP. For example, Toyota Motor's global vision places the same importance on CSP as they do for profit maximization (Toyota Motor 2021). However, Chen et al. (2018) and Christensen et al. (2017) state firms do not place a high priority on CSP to support sustainability efforts but to uphold a strong positive image to stakeholders. If this is the case, it is possible that firms care about projecting a negative view to stakeholders by ignoring CSP as it could lead to worse corporate financial performance (CFP). Although, in contrast, Christensen et al. (2019) found a new idea that it is not very clear whether customers or suppliers make choices of which firm to associate with based on Corporate Social Performance (CSP). From this angle, it is possible to conclude that stakeholders do not care about a firm's image; hence, CSP has no relation to CFP. As seen, the relationship between CSP and CFP is a hotly debated topic. It has been for the past 30 years. This paper aims to tackle this question; however, it is focused on one industry.

To what extent do ethical, social and governance factors relate to the financial performance of firms in the transport industry?

2.2. Relevance

Some academics measured CSP using the ethical, social and governance (ESG) scores. Moving forward, this paper will also follow the same. Most of the prior research was conducted on a macroeconomic level where multiple industries were grouped and studied. In addition, countries' ESG-CFP relation was compared. This paper brings new insights by solely focusing on the transport industry. It paves the way for more industry-based studies to compare ESG-CFP relations between industries and for future studies to find causal relationships between ESG and CFP. It could be easier to find causal relationships from industry focused papers due to lesser factors that may affect the relation.

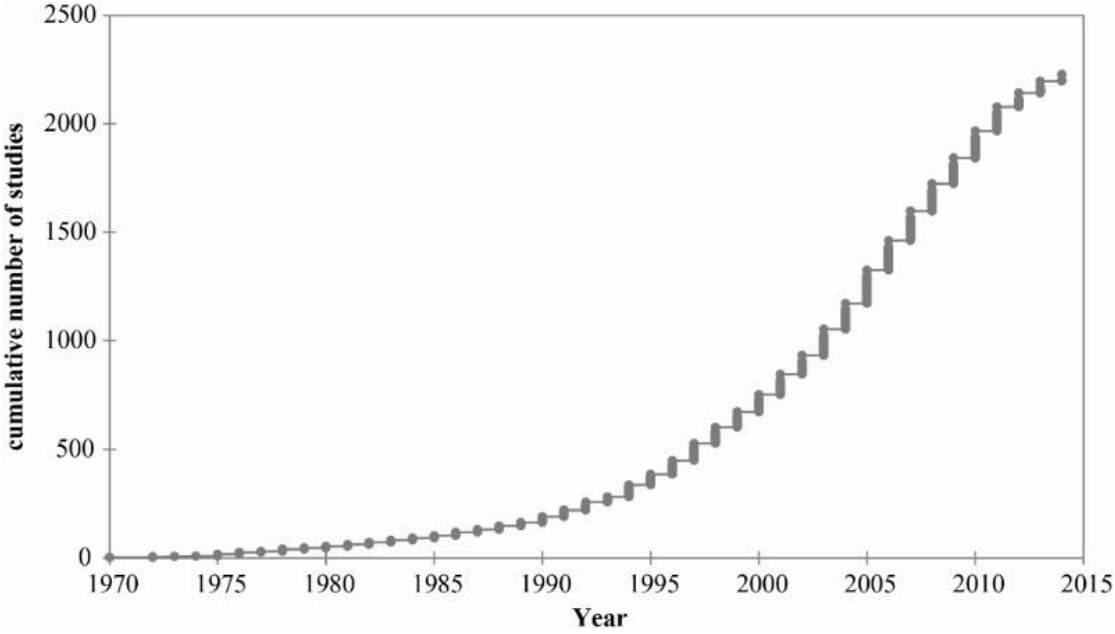

Figure 1. Estimated number of empirical studies on the ESG–CFP relation over time. (Friede 2015)

With the transport industry under scrutiny due to its negative externalities, the social relevance of this paper is to derive potential implications from ESG-CFP relations. For example, in case there are positive relations does this mean Christensen et al. (2017) was correct in the view that firms focus on CSP to have a good brand image which translates to good CFP. It is important to note as causal relationships are not being researched in this study, any potential implication stated is only educated speculation.

2.2. Sub-Questions

To assist in answering the central question, 4 sub-questions are stated below.

1. What is the relation between ESG and revenue?

If the social pressure to be more sustainable has been successful, firms which respect corporate social responsibility (CSR) more should attract a higher number of customers which finally translates to a higher revenue.

2. What is the relation between ESG and profit?

Following a similar logic to revenue, firms which respect CSR more should attract a higher number of customers which leads to a higher profit. However, in this case, increased efforts on CSR could translate to increased costs which leads to a lower profit. It is unclear whether the benefits or costs would be higher here as it depends on each company's individual income statements which may defer extensively.

3. What is the relation between ESG and enterprise value?

Enterprise value in this case is the market value of equity of a firm. Amel-Zadeh (2018) found that investors use ESG data to make investment decisions. Therefore, it is plausible that firms which have higher ESG scores may have higher demand for their shares leading to a higher enterprise value. However, a higher enterprise value could lead to an opposite effect. Investors are unlikely to buy shares with a high price tag. Some investors are also looking to buy shares at low prices and sell shares at high prices.

4. What is the relation between ESG and total asset value?

Total asset value is the sum of all assets in a firm. There should be no relation between ESG and total asset value. The amount of assets owned by a firm usually has nothing to do with the CSP of the firm. Unless a firm specifically sells an asset for funds to work on CSP. In this case, ESG and total asset value would be negatively correlated.

2.4. Brief Chapter Descriptions

The rest of the paper will continue with the theoretical framework where key concepts are defined and explained such as ESG scores and why certain financial performance indicators were chosen for this paper will be explained. It will also cover in depth the reason for studying the transport industry and introduce hypotheses to answer the central research question. Following the theoretical framework, the data section showcases all the data sources used and the descriptive statistics of the data. The methodology explains how the research will be conducted, i.e., which models will be used. Finally, the paper ends with the results and conclusion which will solve the hypotheses; hence, solving the sub-questions and altogether finding a solution for the central research question. In addition, the conclusion will also explain some of the limitations within the paper.

3. Theoretical Framework

3.1. Comprehensive view of ESG

A comprehensive view of ESG entails its definition, importance and disadvantages.
ESG has 3 main factors. Environmental, social and governance (Halbritter 2015). Environmental factors include greenhouse gas emission, waste and pollution, safe and efficient water and land use etc. In essence, it covers the factors that can harm the environment. Social factors include workforce and diversity, safety management in the workplace, customer engagement, effect on communities etc. The social aspect of ESG is people and community focused to make sure employees, customers and localities are treated fairly. Governance includes structure and oversight, code and values, transparency and reporting, cyber risk and systems etc. Governance encompasses the largest range of attributes as it is concerned with how effective, safe and transparent are company or country procedures.

Companies and countries are evaluated based on these characteristics to show how advanced they are with sustainability. There are multiple different ESG score providers and they each may have their own method of evaluating an ESG score (Li 2020). Therefore, ESG scores are subject to inconsistent data measures and results leading to the same group of companies having extremely different ESG scores when evaluated by different ESG score providers (Kotsantonis 2019). Furthermore, most of these providers refuse to share their evaluation methods and processes. This leads to different benchmarks and massive data gaps.

Even though there are multiple issues with comparing ESG scores across providers, lots of empirical studies on CSR still use ESG scores provided by the top providers and many managers take into account ESG scores when making business decisions (Dorfleitner 2015). It is possible to make sound conclusions as long as the studies and managers critically evaluate the validity of the ESG model they chose.

In conclusion, both internal (Dorfleitner 2015) and external (Amel-Zadeh 2018) stakeholders place significant importance on ESG even with its possible short comings.

3.2. Financial performance indicators

There are multiple financial performance measures. This paper will consider popular financial performance indicators. As seen in the sub-questions, there are 4 relations with ESG score which will be studied: revenue, profit, enterprise value and total asset value. The currency for all indicators will

be in USD. Any other selected financial performance measure will be used as a control variable. Those will be explained in the data section below.

Revenue is defined as the total amount of income generated by the sales of goods and services through a firm's primary operations. It has been selected as a financial performance indicator as it is useful as a measure for valuation and it provides new information to the market (Chandra 2008). In addition, there have been multiple studies regarding the relationship between revenue and other indicators. Huang (2015) states that more and more firms have started using sales revenue as a measure for deciding CEO bonuses. This occurs as revenue is considered to provide better information about a firm's value than other sources such as accounting earnings.

Profit is defined as the total costs of a company from a specified time period subtracted from the revenue of that time period. Profit has been selected as a financial performance indicator as many papers found profit as a good measure to value a firm and correlated profit with other variables. Few examples include, Colborne (1993), who found that profit is a good indicator of valuation of a firm. Bain (1941) explains that profit has been used a method of valuation to distinguish monopolies from competition. Many individuals theorised higher rate of profits meant a monopoly whereas lower rates meant a competition. However, there was never extensive proof of this and it was taken as an assumption. Guo (2005) found that customer satisfaction from one period before has a positive effect on profitability of the current period whilst in the same period profit and customer satisfaction are negatively related.

Enterprise value is this paper is the market value of equity. The market value of equity is defined as the market value of total shares of a firm on a specific time stamp. This paper takes the closing date, i.e., end of the year value for all firms for balance sheet items. Enterprise value was selected as a financial performance indicator because it can also work as a proxy for firm valuation. (Hirschey 1985).

Total Asset value is the summation of all assets of a firm at a specific time stamp. This will be the closing date as mentioned above for enterprise value. Total asset value was selected as a financial performance indicator as it can also function as a proxy for firm valuation (Juárez 2018).

3.3. Transport industry

The transport industry includes firms that manufacture and sell vehicles and those that sell transport services. It was chosen due to its paradoxical nature with regards to CSP. It is paradoxical because some firms in the transport industry spend funds and time to have a good CSP when their output causes negative externalities such as air pollution. Gouveia (2018) found that the increasing air pollution is becoming a fatal risk to infants. It is also paradoxical of stakeholders of firms in the transport industry to care about CSP when they likely use the transport industry's output which causes negative externalities.

From as far back as 1999, Forster found that the consumer flights and the aviation industry is a threat to climate change.

3.4. Hypothesis 1

ESG score and revenue are positively correlated.

Firms spend on CSP to strengthen their brand image and create a loyal customer base leading to a higher ESG score. On the other hand, customers would want to associate themselves with firms who are fighting for their cause or spending for their community leading to higher sales. Higher sales ultimately result in higher revenue. Thus, ESG score and revenue may be positively correlated.

3.5. Hypothesis 2

ESG score and profit are positively correlated.

Hypothesis 2 follows a similar logic to hypothesis 1. Increased spending on CSP should lead to higher amounts of customers resulting in higher sales. Higher sales lead to a higher revenue which should translate to higher profits. However, in this case, the costs a firm takes is also accounted for. The CSR expense may also be prominent in the income statement for each period taken. The reason why there would still be a positive correlation is due to the makeup of the ESG score. It includes governance factors such as values and organisation structure which do not count as costs but would still outline the culture and effectiveness of a firm which may indirectly influence sales and profit.

3.6. Hypothesis 3

ESG score and enterprise value are positively correlated.

Amel-Zadeh (2018) found that investors use ESG data because of 4 reasons in order of decreasing importance. Relevance to investment performance, client demand, product strategy and ethical considerations. As investors use ESG data as a factor to decide, it is possible that with higher ESG scores, higher demand for shares may also be observed. Hence, the enterprise value could increase. However, investors look at other factors as well and not only ESG score hence there may not be any correlation. Considering the governance aspect of ESG, it does include transparency reporting. This is essentially important for investors; hence, ESG score and enterprise value are still likely to be positively correlated.

3.7. Hypothesis 4

ESG score and total asset value are negatively correlated.

Total asset value is the sum of all assets in a firm. A firm may sell assets for funding to work on CSP. It is possible that a firm purchases assets which are sustainability related; however, the more likely scenario is a firm selling assets to reinvest to CSP.

4. Data

4.1. Data Sources

This research mainly makes use of quantitative data for empirical analysis. 3 main data sources have been used. These are shown below.

- Fortune
- Orbis
- S&P Database

Fortune was founded in 1929 by Henry Robinson Luce, co-founder of Time magazine, as a magazine for the business elite. Fortune is a credible source as all their data lists are created using peer reviews. A list of 45 companies was selected from Fortune (see Appendix) based on the best industry ranks in 2020 as they are a good representation of the top firms in the industry. Korn Ferry, a global management consulting firm has been providing all the research data to create the list to Fortune for the past 23 years. The industry rank is calculated by first finding all the firms with the highest revenues in a specific industry. Then, these firms are evaluated by their peers in their specific industry. The peer evaluations are numeric scores given on 9 categories with the highest score being 1. The 9 key attributes are shown below.

1. Quality of Management and Leadership
2. Quality of Products and Services
3. Innovativeness
4. Community Responsibility
5. Wise Use of Company Assets
6. Effectiveness in Running a Global Business
7. Value as a Long-Term Investment
8. Soundness of Financial Position
9. Ability to Attract and Retain Talent

This data comes with some caveats. It is always debatable what are the best characteristics to put in a list. As many categories are subjective, this could make each peer review score incomparable with each other. Furthermore, the scores may also be affected by external factors such as company relations.

Orbis is created by Bureau Van Dijk, a major publisher of business information. It has the financial information of more than 400 million firms worldwide. It is a credible source as Orbis gathers data from 170 different data providers and 100s of its own sources to check and cross-verify. Information of revenue, profit, number of employees, enterprise value and total asset value from 2016-2020 for the list of 45 companies was gathered from Orbis.

S&P Global has been providing data, credit-ratings, research, benchmarks and ESG solutions that governments and firms used to make decisions for the past 160 years. It is credible as it has over 1500 credit analysts who calculate and verify data. ESG data from 2016-2020 will be downloaded from this data source for the list of 45 companies. To calculate the ESG score of a company, S&P Global follows 5 key procedures.

1. Risk Atlas

The Risk Atlas is a business sector and regional macro analysis of ESG risks. It is presented as an online infographic of ESG risk profiles and gets its information from observations by credit analysts worldwide and public assessments (for example, the United Nations, World bank, World Health Organization, and Transparency International). The business sector part of the Risk Atlas combines analyses of a business sector's exposure to ESG risk. Social risk includes factors such as human capital and safety management. Environmental risk includes factors such as exposure to land and water use, manufacturing footprint, and packaging. Governance risks include structure, transparency in reporting and code and values.

2. S&P Global Corporate Sustainability Assessment (CSA)

After sector analysis, multiple firms are invited to finish the CSA questionnaire. This is the starting point of an annual evaluation of firms' sustainability activities. Over 10,000 firms globally are assessed in a format where they can be compared. This practice has been ongoing since 1999 and covers various factors as shown below.

3. Meeting

An in-person assessment is completed by credit analysts at S&P Global using the results from the Risk Atlas and CSA.

4. Adjustments

Final analytical judgement and checks are taken by the credit analysts. Corrections are made if necessary. After this procedure, the ESG evaluation is published.

4.2. Variables

Below are the variables created with the data mentioned above. The currency for all monetary variables is in USD. Monetary values have been divided by a million to have smaller values for the sake of presentation. Additional variables may be introduced and explained (in the result section) if necessary for more precise interpretations of results.

1. ESG (Dependent)

The ESG scores from 2016-2020 for each company.

2. Revenue (Independent)

The revenues from 2016-2020 for each company.

3. Profit (Independent)

The profits from 2016-2020 for each company.

4. Value (Independent)

The enterprise values from 2016-2020 for each company. Enterprise value is the market value of a firm at the closing date of the fiscal year.

5. Asset (Independent)

The total asset values from 2016-2020 for each company.

6. Employee (Control)

The number of employees from 2016-2020 for each company.

7. T (Time)

The time variable for panel data analysis. T=1 is 2016, t=2 is 2017, t=3 is 2018, t=4 is 2019 and t=5 is 2020.

4.3. Panel data and descriptive Statistics

The data used for this paper will be structured as panel data. Panel data has numerous advantages compared to cross-sectional and time series data sets. Hsiao (2007) states that panel data has a more accurate inference of model parameters, can provide greater predictions of individual

outcomes by pooling data, captures the complexity of data better than cross-section or time-series models etc.

The descriptive statistics provides a good outlook that helps understand the characteristics of the data. This includes the number of observations, mean, standard deviation, minimum value and maximum value. As seen below in Table 1, there are 225 observations as it accounts for 45 firms' data over 5 years. The standard deviations of all independent variables are very high. They are over the mean which implies that there is wide range of values deviating from the mean. Hence, if value and asset can be seen as proxies for size, it can be concluded that there is a wide range of company sizes which helps in generalizing the conclusion of this paper to the entire transport industry. As table 1 presents descriptive statistics for all t values from 1-5 combined, it does not accurately portray per year company data. Therefore, the descriptive statistics per year are presented in the appendix. The interpretation of the per year data remains the same as the data presented in table 1 as the standard deviations of the independent variables (except profit) are large and higher than the mean.

Table 1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Esgscore	225	49.40	23.27	9	91
Independent Variables					
Revenue	225	48213.30	52411.19	3800	291926
Profit	225	2419.02	3081.57	-12385	13474
Value	225	65285.22	69526.80	4639	661260
Asset	225	75827.42	102458.97	3090	610008
Control Variable					
Employee	225	137936.88	139464.8	8600	671205

4.4. Multicollinearity test

Some independent variables may be strongly correlated with each other which decreases the statistical significance of the results. For example, revenue and profit may be strongly correlated as a higher revenue could generally lead to a higher profit. In addition, revenue, value and asset could be proxies for size so there may be a correlation between them as well. Hence, the multicollinearity test is performed. Firstly, a check for multicollinearity is performed by checking the Pearson correlations.

Table 2

Matrix of Pearson correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Esgscore	1.000					
(2) Revenue	0.297	1.000				
(3) Profit	0.236	0.651	1.000			
(4) Value	0.102	0.640	0.496	1.000		
(5) Asset	0.216	0.931	0.575	0.695	1.000	
(6) Employee	0.285	0.759	0.475	0.477	0.662	1.000

According to Dormann et al. 2013, correlations above an absolute value of 0.700 are a cause for concern as they may distort results. As seen above, some of the Pearson correlations have larger values than 0.700 such as the correlation between revenue and asset (0.931) or revenue and employees (0.759). It is likely that multicollinearity is present; however, before deriving a conclusion, a more formal test will be conducted by calculating the Variance Inflation Factor (VIF). The VIF showcases by what amount will the variance of an estimated regression coefficient rise when predictors are correlated (Akinwande 2015). If the VIF is 1, there is no correlation. A VIF of 1-5 shows a moderate correlation; however, it is not a significant issue. A VIF of 5-10 shows a high correlation which may be a problem. The regression equation used to find the VIF is as follows.

$$Y = B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + C$$

where

y = Esgscore

B(1-5) = regression coefficients

X_1 = Revenue

X_2 = Profit

X_3 = Value

X_4 = Asset

X_5 = Employee

C = constant term

Table 3
Variance inflation factor

	VIF	1/VIF
Revenue	12.054	.083
Asset	9.224	.108
Employee	2.464	.406
Value	2.016	.496
Profit	1.835	.545
Mean VIF	5.519	.

As seen above, the variable revenue has a VIF greater than 10. This is very problematic as revenue is an independent variable which relation must be found to solve hypotheses 1. In addition, the variable asset has a VIF greater than 5 which could affect the statistical significance of hypothesis 4. Hence, to tackle this issue, the variable asset and hypothesis 4 will be discarded in order to have statistically meaningful results. The new regression equation to test VIF is as follows.

$$Y = B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + C$$

where

y = Esgscore

B(1-5) = regression coefficients

X_1 = Revenue

X_2 = Profit

X_3 = Value

X_4 = Employee

C = constant term

Table 4.

Variance inflation factor without asset

	VIF	1/VIF
Revenue	3.717	.269
Employee	2.362	.423
Profit	1.773	.564
Value	1.724	.58
Mean VIF	2.394	.

The VIFs are now below 5 and there is no issue of multicollinearity.

4.5. Test for normal distribution

The data is checked to see if it follows a normal distribution as skewedness in the dataset can affect some regression models. A Shapiro-wilk test is designed to find any deviations from normality. It is more powerful than the K-S test even after a Lilliefors correction (Ghasemi 2012). If the p value (W) of the Shapiro-wilk test is greater than the significance level of 0.05, the null hypothesis that this dataset follows a normal distribution cannot be rejected. Therefore, the data is considered to be normally distributed.

Table 5

Shapiro-Wilk test for normal data

Variable	Obs	W
Esgscore	225	0.908
Revenue	225	0.709
Profit	225	0.888
Value	225	0.716
Employee	225	0.758

As observed in table 5, all W values are greater than 0.05 showing that all variables in this paper follow a normal distribution.

5. Methodology

5.1. Panel data methods

There are 3 distinct methods of analysing panel data. These are the pooled ordinary least squares regression (OLS) model, fixed effects model and random effects model. Each model has its own specific purpose, advantages and disadvantages. Dougherty (2011) outlines how the selection of which method to choose should take place.

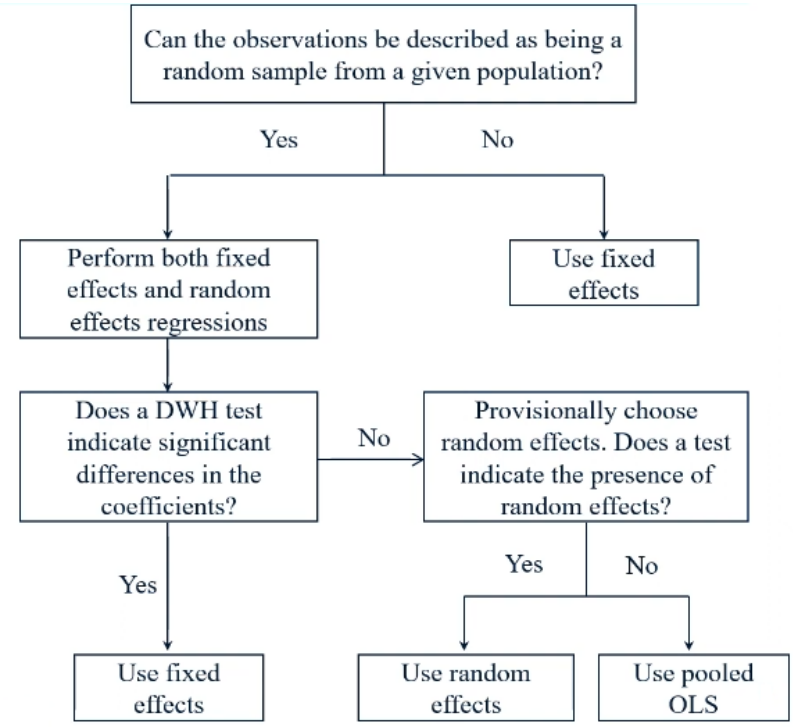

Figure 2. Model selection process for panel data analysis Dougherty (2011).

The selection of 45 companies was not a random sample from the transport industry (the population). As mentioned in the data section, the sample was selected to represent the top firms in the transport industry. Hence, the fixed effects model will be used to analyze the data.

5.2. Fixed effects model

The fixed effects model analyses the impact of variables that vary over time. Both dependent and independent variables in this study vary over time. Fixed effects models remove the effect of time-invariant characteristics so the net effect of independent variables on the dependent variable can be assessed. This is advantageous as there may be some omitted time invariant variables which are hard to measure or observe. In contrast, the key disadvantage of the fixed effects models is that a number of additional parameters must be estimated. The equation for the fixed effects model is as follows.

$$Y_{it} = \alpha_i + \beta_k X_{k,it} + \varepsilon_{it}$$

Where

i = entity (company) and t = time (1-5)

α_i = (i = 1…n) is the unknown intercept for each entity (45 entity-specific intercepts)

Y_{it} = the dependent variable (Esgscore)

$X_{k,it}$ = represents the i^{th} independent and control variables

β_k = the coefficient for respective independent and control variables

ε_{it} = the error term.

6. Results

6.1. Fixed effect model results

Table 6

Fixed effect model results

Variables	Esgscore
Revenue	-0.000187* (0.0000946)
Profit	0.0000993 (0.000258)
Value	0.0000142 (0.0000126)
Employee	-0.0000905* (0.0000438)
_cons	73.47*** (5.133)
N	225
R^2	0.199

Note. Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

The R^2 is 0.199 which means 19.9% of the change in ESG score is explained by the independent and control variables.

6.2. Hypothesis 1

ESG score and revenue are positively correlated.

ESG score is negatively correlated to revenue. The coefficient of revenue is significant at a significance level of 0.05. It seems as stated by Christensen et al. (2019) stakeholders are indifferent to changes in CSP. Therefore, customers do not react even when a firm spends time and money on CSP. In the course of spending on CSP, the opportunity costs may have been a firm's focus on sales leading to falling revenues. To conclude, hypothesis 1 must be rejected as ESG score and revenue are negatively correlated.

6.2. Hypothesis 2

ESG score and profit are positively correlated.

ESG score and profit are positively correlated. However, the p value of profit's coefficient is 0.7. It is not significant given any significance level. Therefore, the null hypothesis that the coefficient of profit is 0 cannot be rejected. As mentioned in the theoretical framework, an increase in CSP may attract more customers but it also incurs more costs. Each company may have had very varied results as shown by the high standard deviation in table 1. In conclusion, hypothesis 2 must be rejected as there is no relation between ESG and profit.

6.3. Hypothesis 3

ESG score and enterprise value are positively correlated.

ESG score and enterprise value are positively correlated. However, the p value of enterprise value's coefficient is 0.260. It is not significant at any given significance level; hence, the null hypothesis that the coefficient of enterprise value is 0 cannot be rejected. As mentioned in the theoretical framework, some investors do take ESG scores into account for making investment decisions Amel-Zadeh (2018); however, investors still consider multiple other factors and most importantly they look for shares with high potential return. In conclusion, hypothesis 3 must be rejected as there is no relation between ESG score and enterprise value.

7. Conclusion and Limitations

7.1. Summary and conclusion

The central question of this study was to what extent do ethical, social and governance factors relate to the financial performance of firms in the transport industry? Hence, the relation between ESG factors and different popular financial performance indicators was analyzed. Starting from the first hypothesis, it is found that ESG and revenue have a negative correlation. This correlation provides an idea that customers are not concerned about the CSP of the firm they choose to deal with. However, there could be multiple unknown factors which cause this correlation as well. Hypothesis 2 and 3 showed that ESG is not related to profit or enterprise value as the coefficients are not statistically significant. This could mean firms defer on revenue and expense levels and how CSP expenses are treated; hence, there is no correlation. Investors also may not primarily focus on ESG to make investment decisions but a variety of other factors.

Hypothesis 1 is only statistically significant to a significance level of 0.05. The trend that was also observed was that as more independent variables were added to the regression equation, the statistical significance of revenue's coefficient dropped along with the value of the coefficient. Along with the other 2 hypotheses conclusions showing that there is no correlation, a conclusion for the central question can be reached. There is no correlation between ESG and CFP.

7.2. Limitations

There are some limitations to this study. Only a few financial performance indicators' relations to ESG were researched. There are many more financial performance indicators such as equity and debt ratios; for example, return on assets ratio etc. The list of companies taken were the 45 most popular companies in the transport industry to take a representative of the best companies of that industry. This means that the sample selected is not a representative of the entire transport industry.

8. Appendix

Table 7
Descriptive Statistics, t=1

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Esgscore	45	54.133	23.764	18	91
Independent Variables					
Revenue	45	43667.178	47432.219	4517	237565
Profit	45	2404.378	2273.12	-675	9427
Value	45	52616.356	48269.004	4639	182046
Asset	45	64668.489	86033.692	3100	431898
Control Variable					
Employee	45	131332.16	133527.55	8600	626715

Table 8
Descriptive Statistics, t=2

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Esgscore	45	52.511	21.682	19	86
Independent Variables					
Revenue	45	48454.933	54258.329	5428	282939
Profit	45	2747	3297.943	-3880	12428
Value	45	64228.578	57946.591	6560	217846
Asset	45	72546.644	99444.814	3090	506336
Control Variable					
Employee	45	133801.42	137279.27	11000	642300

Table 9
Descriptive Statistics t=3

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Esgscore	45	44.222	23.586	9	79
Independent Variables					
Revenue	45	49804.267	53600.087	3800	279065
Profit	45	3253.156	2809.384	-976	12394
Value	45	60115.956	54484.81	5519	212396
Asset	45	77188.067	103750.9	4125	524589
Control Variable					
Employee	45	141651.13	143156.9	12000	664500

Table 10
Descriptive Statistics, t=4

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Esgscore	45	47.8	23.251	14	81
Independent Variables					
Revenue	45	51344.111	54646.557	4564	291926
Profit	45	2664.578	2666.231	-1530	13474
Value	45	67304.444	60820.914	5555	235984
Asset	45	80466.667	108178.22	4431	548299
Control Variable					
Employee	45	143357	144504.81	14000	671205

Table 11
Descriptive Statistics, t=5

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
Esgscore	45	48.356	23.689	12	81
Independent Variables					
Revenue	45	47796.044	53827.477	4634	283757
Profit	45	1026	3798.771	-12385	8997
Value	45	82160.756	108470.3	5259	661260
Asset	45	84267.244	115976.68	4633	610008
Control Variable					
Employee	45	139542.67	144432.42	14400	662575

List of companies selected from Fortune based on industry rank in the transport sector.

1. Southwest Airlines
2. FedEx
3. Delta Air Lines
4. UPS
5. Singapore Airlines
6. BMW
7. Air France-KLM group
8. Airbus Group
9. ANA Holdings
10. BAE Systems
11. Bridgestone
12. C.H Robinson Worldwide
13. Caterpillar
14. Continental
15. Cummins
16. Daimler
17. Deere
18. Denso
19. Deutsche Post DHL Group
20. Emerson Electric
21. Fortive

22. General Dynamic
23. General Motors
24. Honda Motor
25. Hyundai Motor
26. Illinois Tool Works
27. L3Harris Technologies
28. Lear
29. Lockheed Martin
30. Lufthansa Group
31. Michelin
32. Nippon Express
33. Northrop Grumman
34. Oshkosh
35. Paccar
36. Polaris
37. Raytheon Technologies
38. Siemens
39. Tesla
40. Thales Group
41. Toyota Industries
42. Trane Technologies
43. Union Pacific
44. Volkswagen
45. Volvo

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