How ESG Influences Financial Performance: Insights from firms in BRIC countries

Evaluating the ESG-Financial Relationship and the Post-Paris Agreement Effect in BRIC Countries

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Abstract

This thesis examines the relationship between Environmental, Social, and Governance (ESG) performance and financial performance in BRIC countries (Brazil, Russia, India, and China). Previous research suggests a positive correlation between ESG practices and financial performance in developed markets, while the effect in developing markets remains ambiguous. By focusing on BRIC countries, this study aims to clarify whether ESG performance contributes to financial outcomes in these leading emerging economies. Using data from 186 firms over a ten-year period (2012-2021), the study employs Panel Data Regression to analyse the impact of ESG scores on financial performance, measured by Tobin's Q. Moreover, the study examines whether the Paris Agreement (2015) caused a structural change in this relationship.

Overall, the study finds a positive significant relationship between overall ESG performance and financial performance in BRIC countries. Moreover, when examining the E, S and G performance indicators separately, the Environmental and Governance components show a significant positive effect on financial performance. As for the country-specific analyses, Environmental performance has a significant positive effect on financial performance in Brazil. Moreover, post Paris-Agreement (2015) changes in Social performance have a positive impact on financial performance for the BRIC countries and in India specifically highlighting the influence of international agreements on corporate behaviour. The results suggest that BRIC countries, as frontrunners among developing economies, exhibit a clear positive relationship between Social and Governmental practices and financial performance, supporting stakeholder theory. These findings provide valuable insights for investors, corporate leaders, and policymakers on the concept of ESG investing within the context of BRIC countries.

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1. Introduction

1.1 Terminology

The terms "Environmental, Social, and Governance (ESG)," "responsible investing," and "sustainable investing" collectively describe how firms demonstrate their commitment to sustainability (Matos, 2020). The role of corporate sustainability has become increasingly popular due to growing global population and challenges faced by climate change (Peylo, 2012). According to Peylo (2012) corporate sustainability only works optimally if all stakeholders benefit. According to stakeholder theory (Freeman, 1984), a firm's focus should not be only on maximising value and profit for stockholders. The interests of all stakeholders should be considered since this enables a business to achieve a competitive advantage, which leads to better financial performance (Freeman, 1984). On the contrary, shareholder theory (Friedman, 1962) argues that corporations should maximise shareholder value and profit, implying that corporate sustainability should not be a corporation's objective. Nonetheless, according to Smith (2003) corporate sustainability can cooperatively increase with financial performance. Huang (2021) adds to this that ESG investing can be in corporations' best financial interest (Huang, 2021). Furthermore, there is an emerging pattern of increased ESG engagement in developing countries, suggesting that developing markets are catching up with developed markets (Yoon et al., 2018). The BRIC countries form the frontrunners of the developing markets and have surpassed G7 countries in GDP based on purchasing power parity (Hult, 2009). In this thesis, the relationship between ESG and financial performance across BRIC countries is examined.

1.2 Inspirational article

Naeem and Cankaya (2022) served as inspiration by exploring the financial effects of ESG practices within corporations operating in environmentally sensitive industries. Analysing a sample of 383 corporations over ten years, they find a robust positive correlation between comprehensive ESG performance and financial performance, particularly pronounced in developed markets. Naeem & Cankaya (2022) divided countries into two groups, developing and developed. For the developing countries, no ESG performance metric had a significant effect on firm performance. However, this is not aligned with the emerging pattern of increased ESG engagement in developing markets (Yoon et al.,

2018). Furthermore, Neto and Fontgalland (2023) note that firms in BRIC countries are incorporating ESG metrics into their profitability strategy. Lastly, Dalal and Thaker (2019) examine 100 Indian public limited companies and find significant effect of ESG factors on market value, which suggests that this may also hold true for the BRIC countries.

1.3 Scope of study

In this study, the methodology by Naeem and Cankaya (2022) is to be replicated, although the research itself differs from the existing study. Firstly, the focus will not be on ESG scores in sensitive industries of developing countries specifically, but instead be a comparison of all industries in BRIC countries. Examining the BRIC countries as a separate entity from developing countries can provide insights into whether the patterns observed are consistent within this economic clusters. According to Neto and Fontgalland (2023), the BRIC countries are expanding the integration of ESG criteria within their financial market. The study finds that during the period studied, the average profitability of ESG indices was consistently higher than that of broader indices across all examined countries, suggesting that ESG-focused firms may offer better financial performance. Moreover, Gonçalves et al. (2023) identify positive spillovers in ESG-financial performance in Europe following the Paris Agreement. In this study, it will be identified whether there is also a significant positive effect on ESG-financial performance on the BRIC countries following the signing of the Paris Agreement (2015). This leads to the following research question: “For BRIC countries, how does Environmental, Social, and Governance (ESG) performance affect financial performance and has the Paris Agreement (2015) contributed to this effect?”

1.4 Methodology and Data

To answer the research question, this research will fit a Panel Data Regression to determine how ESG performance influences financial performance. This regression will be performed on the whole dataset accounting for country fixed effects, and subsets per country over 2012-2021. Furthermore, interaction terms will be included to determine if there is a structural break in the data, testing for a significant difference in ESG-financial performance before and after the signing of the Paris Agreement (2015). The data on the firms is extracted from the Refinitiv Eikon database (Refinitiv, 2022). To perform the

analyses, financial performance is defined by Tobin's Q. This metric is aligned with previous research (Bhaskaran et al., 2020; De Lucia et al., 2020; Shakil et al. 2019; Ting et al., 2019; Velte, 2017). Tobin's Q is used to evaluate financial performance and market value by comparing the current market value to its book value (Velte, 2017). This metric is crucial in the study because it indicates whether the market values the corporation's efforts to enhance its ESG performance (Velte, 2017). The independent variables: E-, S-, G-, and ESG-combined scores are common metrics used to demonstrate firm commitment to sustainability (Naeem and Cankaya, 2022). Furthermore, size is implemented as control variable since big companies tend to benefit from economies of scale, which influences financial performance (Aydoğmuş & Gülay, 2022). Furthermore, debt-ratio is included since higher leverage may negatively affect market valuation due to increased financial risk (Arhinful & Radmehr, 2023).

1.5 Expectations

This study expands the research on the ESG-financial performance relationship, by focusing on the economically significant BRIC countries. It is suggested that the previous research by Naeem and Cankaya (2022) misrepresented the BRIC countries, as they were being overshadowed by the other developing countries in the sample. This research aims to offer a clear picture of ESG effects on financial performance in the BRIC countries. The expectation is that ESG performance has a positive effect on financial performance in BRIC countries. This study aims to contribute to the literature by clarifying the strength of the ESG-financial performance relationship, which is not only present in developed countries, but also in the BRIC countries. It is anticipated that the findings will provide investors and corporate leaders with evidence to drive a shift towards sustainable investment and provide guidance as to whether this should be done in BRIC countries.

1.6 Findings

The analysis performed in this study shows that for BRIC countries a positive relationship can be found for the Environmental, Social, and Governance (ESG) performance indicators, where Environmental and Governance are significant. This outcome is different from previous studies that suggest no significant relationship for developing countries, which includes the BRIC countries. Looking at the BRIC countries, as frontrunners of the

developing countries, there is a significant effect of ESG performance on financial performance. Moreover, it can be found that the Social performance significantly improved after 2015 for the BRIC countries as a whole and India individually. However, the Environmental and Governance performance did not show significant change, expect for a negative significant change of Environmental performance in India. Overall, this shows that international initiatives such as the Paris Agreement (2015) can drive investors and corporate leadership in significant ways.

1.7 Outline

The remainder of this thesis is structured as follows. Section 2 reviews the relevant literature and previous research. Section 3 outlines the dataset and methodology utilized for the analysis. Section 4 presents the main results, including the testing of the proposed hypotheses. Section 5 discusses the findings in the context of existing literature. Section 6 provides a summary and conclusion of the research, with additional supportive materials provided in the Appendix.

2. Theoretical Framework

2.1 Environmental, Social and Governance (ESG) principles

Environmental, Social, and Governance (ESG) performance is defined as "a metric system used to assess a corporation's adherence to socially responsible practices across three key areas: environmental sustainability, social responsibility, and governance" (Kai & Au, 2023). The aim of ESG is to incorporate Environmental, Social, and Governance factors in investment decisions (Daugaard & Ding, 2022). Therefore, ESG is a standard used by investors to evaluate corporate behaviour and future financial performance (Daugaard & Ding, 2022). Since the ESG principle was proposed, a new pattern of sustainable development has occurred where ESG principles set the standards (Daugaard & Ding, 2022), making ESG performance crucial for evaluating a company's non-financial effect (Kai & Au, 2023).

Firstly, Jinga (2021) argues that the Environmental aspect of ESG is important in combating climate change since firms showing commitment to sustainability contribute to global sustainability efforts. In addition, Jinga (2021) mentions that companies that adhere to strong governance practices tend to experience fewer scandals and legal issues. Furthermore, socially responsible companies that prioritize human rights, labour standards, and community relations enjoy enhanced brand loyalty and employee satisfaction (Jinga, 2021). Moreover, Macey (2022) suggest that ESG principles have become increasingly important because the public has lost its confidence in government policies to adequately address societal and environmental challenges. Due to the government's inefficiency, private-sector solutions are increasingly seen as preferable (Macey, 2022). This illustrates that ESG principles are not just ethical considerations but are aligned with the long-term financial performance of companies.

2.2 Financial performance

Financial performance is a measurement used to determine how a company generates revenue and profits derived from its assets (Stobierski, 2021). It uses financial metrics to examine this impact of the assets on profitability (Stobierski, 2021). One of these metrics is Tobin's Q, which is used because it provides insights into how a company uses its assets

to generate market value relative to the replacement cost of those assets (Carlos & Sauaia, 2003). It is a useful metric because it combines the market expectations with the asset value of the firm which provides a clear representation of the company's financial health (Carlos & Sauaia, 2003).

2.3 ESG-Financial performance

According to Jinga (2021) the environmental responsibility of firms aligns with the increased financial risks that are posed by climate change. Moreover, the study finds that good governance performance also supports stronger and more stable financial performance (Jinga, 2021). In addition, Kai and Au (2023) mention the significant effect of ESG performance on long-term financial performance. Kai and Au (2023) found that companies integrating ESG criteria into their operations are seen as more attractive investments, which leads to enhanced reputation and sustainability in competitive markets. Whelan et al. (2021) add to this by addressing that high ESG-scores could lead to enhanced reputation and brand loyalty. Lastly, sustainable and coordinated development that takes ESG benefits into account tend to positively affect financial performance (Li et al., 2021).

Friede, Busch, and Bassen (2015) provide a foundational perspective by aggregating the findings from over 2000 empirical studies that examine the relationship between ESG integration and financial performance. This analysis confirms a positive correlation between robust ESG practices and financial performance metrics such as return on assets and equity, highlighting that firms with higher ESG ratings often achieve better financial results. This comprehensive review serves as a cornerstone for this research, offering a global perspective for comparing how ESG factors influence financial outcomes. Furthermore, in Alshehhi et al. (2018), a comprehensive literature review, shows that a significant proportion of the studies reviewed report a positive relationship between ESG practices and financial performance.

Moreover, Bhaskaran et al. (2020) examines the effect of ESG on financial performance using metrics like Tobin's Q, ROE, and ROA across 4,887 global firms. They concluded that firms with high performance in ESG aspects tend to create more value in the market. Complementing this broad perspective, Velte (2017) focuses on the ESG-financial

performance linkage within a specific national context of a developed country—Germany. Velte's findings suggest that the positive effect of ESG performance on financial metrics observed globally holds true in the German context which indicates that geographical and economic contexts do not diminish the ESG advantage. Adding to this, Naeem and Cankaya (2022) concludes that while there is a strong positive relationship between ESG performance and financial outcomes in developed countries, this relationship is weaker in emerging markets. The study argues that while the positive impact of ESG on financial performance is established in developed markets, BRIC countries have a substantial opportunity to improve their ESG efforts to catch up.

Focusing on the BRIC countries individually, Dalal and Thaker (2019) provide empirical evidence on the influence of ESG factors on the financial performance of Indian public limited companies. The study evaluates how ESG performance correlates with profitability and firm value, using measures like Return on Assets (ROA) and Tobin's Q. They find a strong positive relationship between strong ESG performance and financial performance suggesting that ESG enhance financial performance for Indian firms. Moreover, Santis et al. (2016) focus specifically on Brazil and examine whether firms recognized for their sustainability practices outperform their peers in financial terms. The research provides evidence that links strong ESG performance to better financial outcomes. Furthermore, Xu and Zhu (2024) analyse the effect of ESG performance on financial performance in China. They find that high ESG performance is linked with improved financial performance, especially in the long term.

Moreover, the BRIC countries are expanding the integration of ESG criteria within their financial markets. This relevance is underscored in the study by Neto and Fontgalland (2023), which examines the performance of ESG indices such as the MSCI ESG Leaders Index in the financial markets of the BRIC countries. The research confirms that during the period studied, the average profitability of ESG indices was consistently higher than that of broader indices across all examined countries, suggesting that ESG-focused firms offer better financial performance. Furthermore, Tripathi and Kaur (2020) evaluate the performance of socially responsible investing (SRI) within the BRIC countries, analysing

how investments that consider corporate social responsibilities effect financial returns compared to traditional investments.

Lastly, Gonçalves et al. (2023) argue the Paris Agreement (2015) has led to increased awareness and integration of ESG factors into financial and operational strategies. The study identifies positive spillovers on ESG performance in Europe following the Paris Agreement (2015). Companies increasingly adopted sustainable practices that align with the goals of the agreement, demonstrating that such international initiatives can drive corporate behaviour in significant ways. Moreover, the study finds a statistically positive relationship between ESG scores and financial performance post-2015, particularly noting that the Social component of ESG has a pronounced effect. This suggests that companies focusing on strong social governance can derive substantial value.

2.4 Limitations

This study assumes stakeholder theory (Freeman, 1984) which argues that the best interest of all stakeholders should be considered. This enables a business to achieve a competitive advantage, which leads to better financial performance (Freeman, 1984). On the contrary, shareholder theory (Friedman, 1962) argues that corporations should maximize shareholder value and profit. This implies that corporate sustainability is not a corporation's objective (Friedman, 1970). Furthermore, Macey (2022) notes that shareholder theory can incentivize corporate managers to greenwash by pretending to commit to sustainability initiatives to inflate their firm's stock. Moreover, Clément et al. (2022) argue that while ESG scores are widely used as indicators of sustainable practices, they often fall short because they do not fully integrate essential sustainability concepts. The paper suggests that ESG scores tend to focus more on the materiality of issues, which can overshadow the broader, more integrated aspects of sustainability.

2.5 Research expectations

The theoretical framework shows a potential relationship between ESG practices and financial performance in BRIC countries. While research has been conducted on the influence of ESG factors on financial performance in developed markets, the dynamics within BRIC countries remain underexplored. The existing literature demonstrates a

positive effect of ESG scores on financial in developed countries (Naeem & Cankaya, 2022). However, Naeem and Cankaya (2022) find no significant effect for developing countries, including the BRIC countries. This study differs by focusing specifically on the BRIC countries as a distinct subset, separate from other developing countries. This leads to the following hypotheses:

Hypothesis 1A (H_1):
The level of ESG performance is has a significant positive effect on the financial performance of firms across BRIC countries.

Hypothesis 1B (H_1):
The Environmental score aspect of ESG performance has a significant positive effect on the financial performance of firms across BRIC countries.

Hypothesis 1C (H_1):
The Social score aspect of ESG performance has a significant positive effect on the financial performance of firms across BRIC countries.

Hypothesis 1D (H_1):
The Governance score aspect of ESG performance has a significant positive effect on the financial performance of firms across BRIC countries.

Moreover, taking each country separately, it is also expected that there is a positive effect of E, S, G and ESG-combined scores on financial performance.

Hypothesis 2A (H_1):
E, S and G performance has a significant positive effect on the financial performance of firms in Brazil.

Hypothesis 2B (H_1):
E, S and G performance has a significant positive effect on the financial performance of firms in Russia.

Hypothesis 2C (H_1):
E, S and G performance has a significant positive effect on the financial performance of firms in India.

Hypothesis 2D (H_1):

E, S and G performance has a significant positive effect on the financial performance of firms in China.

Lastly, it is expected that a structural break occurs at the signing of the Paris Agreement (2015), where the effects of ESG scores on financial performance after the signing will be significantly higher than before 2016 (Gonçalves, Barroa and Avelar (2023).

Hypothesis 3A (H_1):

There is a significant break in the relationship between ESG-combined performance and financial performance after the signing of the Paris Agreement (2015) of firms in BRIC countries.

Hypothesis 3B (H_1):

There is a significant break in the relationship between E, S and G performance and financial performance after the signing of the Paris Agreement (2015) of firms in BRIC countries.

3. Data description and Methodology

3.1 Data

The final panel data set for this study contains the ESG and financial data of 186 unique corporations, with International Securities Identification Number (ISIN) as the panel identifier, from the 4 BRIC countries for a 10-year period.

3.1.1 Dependent variable

Financial performance is measured by the dependent variable Tobin's Q, *Tobinsq_L*, which is the ratio of the market capitalisation to the replacement cost of total assets (Formula 1).

Formula 1:

Calculation of Tobin's Q

$$Tobinsq\_L = \frac{Market\ Capitalization\ (\$)}{Replacement\ Cost\ of\ Total\ Assets\ (\$)}$$

A Tobin's Q ratio greater than 1 suggests that the market values the company more than the cost of its assets, indicating that investors expect the firm to generate future growth. Conversely, a ratio less than 1 might indicate that the company is undervalued or seen as having poor growth prospects (Carlos & Sauaia, 2003). According to Choi and Wang (2009), the ESG-financial relationships effect does not happen instantly, hence there is a 1-year lag incorporated for *Tobinsq_L* to effectively determine the effect of ESG performance.

3.1.2 Independent variables

The ESG performance is measured by the independent Environmental, Social, Governance and ESG-combined score, *TRESCGS, as* the independent variables representing. The ESG-combined score is made up of three pillars with a respective weighted average of 34%, 42%, and 24% (Environmental, Social and Governance (ESG) Scores from Refinitiv, 2022). Firstly, the Environmental score, *ENSCORE*, reflects commitment towards environmental and ecological stability and sustainability. Secondly, the Social score, *SOSCORE*, describes the successfulness in obtaining loyalty and trust from stakeholders.

Thirdly, the Governance score, *CGSCORE*, assures that the shareholders best interest is protected through reporting transparency (Environmental, Social and Governance (ESG) Scores from Refinitiv, 2022).

3.1.3 Control variables

To obtain the actual effect of ESG performance on financial performance, the following control variables are, aligned with previous studies, incorporated as characteristics of the model. Firstly, the control variable size is used since Rettab et al. (2009) have observed that larger corporations encounter more pressure from stakeholders regarding undertaking ESG initiatives. Moreover, economies of scale affect financial performance of larger corporations. Therefore, the natural logarithm of total assets is used to account for Size, which is aligned with previous studies. (Bhaskaran et al., 2020; Velte, 2017). Secondly, the control variable debt-ratio is used which has a significant negative impact on Tobin's Q, which indicates indicating that higher leverage may negatively affect market valuation due to increased financial risk (Arhinful & Radmehr, 2023).

Table 1

Summary of variables

Variables	Name	Identifier	Description	Period
Dependent variable	Tobin's Q	*Tobinsq_L*	Market Capitalization/ Replacement cost Total Assets	2013 to 2021
Independent variables	ESG	TRESGCS	Aggregate ESG score of the corporation as calculated by Refinitiv Eikon ESG database	2012 to 2021
	Environmental	*ENSCORE*	Aggregate E score of the corporation as calculated by Refinitiv Eikon ESG database	2012 to 2021
	Social	*SOSCORE*	Aggregate S score of the corporation as calculated by Refinitiv Eikon ESG database	2012 to 2021

	Governance	*CGSCORE*	Aggregate S score of the corporation as calculated by Refinitiv Eikon ESG database	2012 to 2021
Control variables	Size	*Size*	Natural log of the Total Assets	2012 to 2021
	Debt-ratio	*Debt-ratio*	Total Debt / Total Assets	2012 to 2021

Table 2

Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Tobinsq_L	1,656	1.135261	1.914498	.0017696	25.62205
TRESGCS	1,857	47.54292	18.23614	1.76	92.49
ENSCORE	1,857	47.00803	24.42945	.23	97.3
SOSCORE	1,857	50.90504	23.38355	.37	95.87
CGSCORE	1,857	52.4703	22.59781	.47	97.09
Size	1,857	16.36781	1.644632	11.85969	22.27771
Debt-ratio	1,857	.3165784	.2250312	0	2.022832

Note. With 1,857 observations for most variables, the dataset is robust, providing a good basis for statistical analysis. The mean value of Tobin's Q is slightly above 1, indicating that, on average, firms are valued slightly higher than their book value. The Governance score has the highest mean, followed by the Social and Environmental scores.

3.2 Methodology

All estimation models are run in STATA. Panel Data Regression is used in hypothesis 1 and 2 as a statistical method to estimate the relationship between one or more independent variables and the dependent variable. Moreover, to test hypothesis 3, interaction terms are included to capture potential differential impacts in the post Paris Agreement (2015) period.

3.3 OLS assumptions

The OLS assumptions were met to validate the results. An examination of these assumptions and the diagnostic tests performed are provided in the Appendix. Panel Data

Regression assumes that the relationship between the dependent variable and independent variables is linear. This assumption was assessed using a residual vs. fitted values plot (Figure 1), which did not indicate any severe deviations from linearity. Moreover, the normality of residuals was assessed using a Q-Q plot (Figure 2). It displayed some deviations from the diagonal line however, most residuals followed the normal distribution, suggesting that any deviations are not substantial enough to invalidate the regression results. Furthermore, homoscedasticity was evaluated by examining the residuals vs. fitted values plot (Figure 1) which indicated that the variance of residuals was constant across levels of the independent variables. Lastly, multicollinearity was assed using the Variance Inflation Factor (VIF) of which the mean was 1.44 suggesting that multicollinearity is not a significant concern in the data (Table 15). These tests confirm that the assumptions underpinning OLS regression are satisfied.

3.4 Estimation procedure

To estimate the relationship between ESG performance of firm's and their financial performance, a Panel Data regression is used. Choi and Wang (2009) emphasize that a 1-year lag should be incorporated for the financial performance metric since performance indicators do not instantly affect firm's financial performance. Alshehhi et al. (2018) find that this is also the case for Environmental, Social and Governance performance indicators. Therefore, the financial performance of each corporation is lagged 1 year, for example 2013, to their respective ESG performance at the given year, for example 2012. This leads to model 1 and 2 for ESG-combined score and E, S and G scores, respectively.

Model 1

Regression ESG-combined

$$Tobinsq_L = \beta 0 + \beta 1 \; x \; TRESCGS + \beta 2 \; Post + \beta 3 \; x \; Control \; Variables + \varepsilon i$$

Model 2

$$Tobinsq\_L = \beta 0 + \beta 1 \; x \; ENSCORE(t) + \beta 2 \; x \; SOSCORE(t) + \beta 3 \; x \; CGSCORE + \beta 4 \; x \; Post + \beta 5 \; x \; ENSCOREXP + \beta 6 \; x \; SOSCOREXP + \beta 7 \; x \; CGSCOREXP + \beta 8 \; x \; Control \; Variables + \varepsilon i$$

To begin, regression analysis will be conducted on the entire sample to evaluate the relationship between ESG and financial performance of BRIC corporations. In this regression, country-fixed effects are considered, to control for unobserved heterogeneity that varies across countries over time. This method helps to account for differences between countries that do not change over time and might otherwise bias the results of an analysis. Additionally, to compare the effect of ESG performance on the financial performance of corporations from each BRIC country, the regression models will be run separately for each country. Lastly, interaction terms have been included to test for a significant change post Paris Agreement (2015).

4. Results

The model was estimated using Panel Data Regression. The dependent variable, Tobin's Q, is a ratio and the independent variables, ESG, are in scores. Therefore, a change in the Environmental, Social, Governance, or ESG-combined score by 1 unit leads to a change in the Tobin's Q ratio by the value of the corresponding coefficient.

4.1 ESG-combined performance

The regression results (table 3) suggest that the ESG-combined score, which represent the overall ESG performance, has a significant positive relationship with the Tobin's Q for the BRIC countries combined. This suggests that strong ESG performance enhances financial performance in BRIC countries. Therefore, the null hypothesis 1A, stating that the level of ESG performance has not a significant positive effect on the financial performance of firms across BRIC countries is rejected. This includes the country fixed effects which allow to control for unobserved, time-invariant country-specific factors, providing a clearer picture of the within-country effects of the independent variables on Tobin's Q. Theoretically, the positive significant relationship between Tobin's Q with the overall ESG performance of companies aligns with the stakeholder theory (Freeman, 1984) and contradicts the shareholder theory (Friedman, 1962). The model's R-squared was 0.297, which means that 29.7% of the variance in the financial performance can be explained by the variables included in the model.

However, when evaluating the overall ESG-financial performance relationship for the individual countries, no significant effect can be found, expect for Brazil with a marginally significant positive effect on Tobin's Q, statistically significant at the 10% level ($p < 0.10$), but not at the 5% level ($p < 0.05$). This discrepancy can occur due to several reasons. First, the BRIC model combines data from Brazil, Russia, India, and China, resulting in a larger sample size (1,656 observations). Larger samples provide more statistical power, making it easier to detect significant effects even if the effect sizes are small. In contrast, when data is split into individual countries, each country has a smaller sample size (e.g., Brazil with 453, Russia with 209), reducing the power of the statistical tests and making it harder to detect significant effects. Secondly, while country fixed effects control for unobserved,

time-invariant characteristics, they do not control for time-varying idiosyncratic variations within each country. When data from multiple countries is combined, these idiosyncratic variations might average out, leading to a clearer detection of the overall effect of ESG-combined performance. Thirdly, when the effect of ESG is consistent but small across countries, pooling the data increases the chance of detecting this effect as significant. This is illustrated as table 3 shows that a change of 1 in ESG-combined score results in a 0.0199 change of Tobin's Q. Hence, aggregating data from multiple countries increases statistical power and controls for country-specific characteristics, allowing the detection of effects that may not be significant in smaller, more variable individual country samples.

Lastly, the interaction term (table 3) does not significantly affect Tobin's Q in the BRIC combined model or in any of the individual country models. This implies that the relationship between ESG scores and firm value does not change in a meaningful way after Paris Agreement (2015). Therefore, hypothesis 3A cannot be rejected. The results suggest that while ESG-combined influences firm performance, these effects are not significantly altered by the Paris Agreement (2015).

Table 3

Regression results ESG-combined performance

Tobinsq_L	BRIC	Brazil	Russia	India	China
TRESGCS	0.0119**	0.00697	0.00924	0.00882	-0.00153
	(0.002)	(0.074)	(0.576)	(0.264)	(0.643)
Post	0.136	-0.329	0.716	0.742	-0.00259
	(0.558)	(0.220)	(0.385)	(0.169)	(0.984)
TRESGCSxP	-0.0000587	0.00660	-0.0104	-0.00581	-0.00000217
	(0.990)	(0.165)	(0.576)	(0.574)	(1.000)
Size	-0.475***	-0.339***	-0.172	-0.832***	-0.171***
	(0.000)	(0.000)	(0.073)	(0.000)	(0.000)
Debt_ratio	-2.437***	-1.614***	-0.0262	-3.728***	-0.691***
	(0.000)	(0.000)	(0.957)	(0.000)	(0.000)
_cons	9.020***	6.425***	3.141	15.58***	3.815***

	(0.000)	(0.000)	(0.060)	(0.000)	(0.000)
N	1656	453	209	615	379
adj. R-sq	0.297	0.278	0.003	0.399	0.386

Note. Regression results using Panel Data Regression on dependent variable, Tobin's Q, with independent variable, ESG-combined, from the BRIC countries combined including country-fixed effects and separately. P-values in parentheses * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

4.2 Environment, Social and Governance performance

Secondly, the regression results (table 4) show the Environment, Social and Governance score as independent variables, which represent the separate E, S or G performance. The results show that of the underlying E, S and G components of ESG-combined, the Environmental and Governance performance have a significant positive effect on the financial performance for the BRIC countries combined. Therefore, the null hypothesis 1B and 1D stating that the level of Environmental and Governance performance has no significant positive effect on the financial performance of firms across BRIC countries is rejected. On the contrary, the null hypothesis 1C regarding the Social score cannot be rejected. The model's R-squared was 0.303, which means that 30.3% of the variance in the financial performance can be explained by the variables included in the model.

Moreover, when looking at the individual countries, there is a significant positive effect of Environmental score on Tobin's Q in Brazil. Therefore, hypothesis 2A can be partially rejected regarding the Environmental-financial performance in Brazil. Regarding the Governance and Social performance, hypothesis 2A cannot be rejected. It is therefore, suggested that Environmental performance positively impacts financial performance for firms in Brazil. However, hypothesis 2B, 2C and 2D cannot be rejected, as no significant E, S or G relationship with financial performance can be found in Russia, India, and China.

Lastly, the interaction term of Social score (table 4) shows significance in the BRIC model and in India, suggesting that post Paris-Agreement (2015) changes in Social scores have a significant positive impact on Tobin's Q for the BRIC countries and India specifically.

Therefore, hypothesis 3B can be rejected regarding the effect of Social on financial performance. This implies that the relationship between Social performance and firm performance does positively changes in a meaningful way after Paris Agreement (2015). However, it is notable that the interaction term of Environmental score (table 4) suggests that the change in Environmental scores has a significant negative impact on Tobin's Q in India.

Table 4

Regression results E, S and G performance

Tobinsq_L	BRIC	Brazil	Russia	India	China
ENSCORE	0.00851*	0.0129**	-0.00553	0.0117	0.00272
	(0.046)	(0.002)	(0.709)	(0.260)	(0.277)
CGSCORE	0.00678*	0.00317	0.00497	0.00293	-0.000139
	(0.036)	(0.383)	(0.610)	(0.662)	(0.946)
SOSCORE	-0.000195	-0.00441	0.00850	-0.00456	-0.00350
	(0.966)	(0.377)	(0.524)	(0.692)	(0.352)
Post (P)	0.00437	-0.288	0.423	-0.212	0.0403
	(0.986)	(0.321)	(0.615)	(0.723)	(0.766)
ENSCOREXP	-0.00870	0.00384	0.00297	-0.0343**	0.00265
	(0.080)	(0.444)	(0.864)	(0.004)	(0.357)
CGSCOREXP	-0.000954	0.00186	0.0143	-0.00156	-0.00480
	(0.810)	(0.684)	(0.235)	(0.845)	(0.051)
SOSCOREXP	0.0108*	-0.000549	-0.0209	0.0402**	0.00200
	(0.041)	(0.931)	(0.194)	(0.004)	(0.627)
Size	-0.495***	-0.412***	-0.145	-0.848***	-0.185***
	(0.000)	(0.000)	(0.155)	(0.000)	(0.000)
Debt-ratio	-2.406***	-1.827***	-0.362	-3.642***	-0.843***
	(0.000)	(0.000)	(0.479)	(0.000)	(0.000)
_cons	9.188***	7.451***	2.837	15.78***	4.060***
	(0.000)	(0.000)	(0.101)	(0.000)	(0.000)
N	1656	453	209	615	379

adj. R-sq	0.303	0.325	0.017	0.419	0.418

Note. Regression results using Panel Data Regression on dependent variable, *Tobin's Q*, with independent variable, *Environment, Social and Governance,* from the BRIC countries including country-fixed effects combined and separately. P-values in parentheses * p<0.05, ** p<0.01, *** p<0.001.

4.3 Control variables

The control variables had expected significance in sign and magnitude. The consistency of the negative coefficient across both models suggests a robust negative relationship between firm size and financial performance. Moreover, the negative coefficient for debt-ratio suggests that firms with higher leverage (more debt relative to equity) tend to have lower market valuations relative to their assets.

5. Discussion

First, the results show that ESG performance significantly enhances financial performance in BRIC countries. This study complements Friede, Busch, and Bassen (2015) who provided a broad, foundational perspective about a positive relationship between ESG performance and financial outcomes.

The findings in this study are different to Naaem and Cankaya (2021). They find that there is a strong positive relationship in developed countries, and that this relationship is weaker in emerging markets. In this study, focusing on the BRIC countries as part of the developing countries gives a well-defined context of research. The limitation of Naaem and Cankaya (2021) is namely that by generalizing all the developing countries, the underlying frontrunners, the BRIC countries have been overshadowed by the other developing countries. The relationship found in this study, namely that BRIC countries ESG-financial relationship is significant, confirms this idea. Moreover, when assessing the E, S and G performance indicators separately a positive relationship can be found with financial performance, which is significant for Environmental and Governance performance. This supports the stakeholder theory (Freeman, 1984) and opposes the shareholder theory (Friedmann, 1962).

Furthermore, Bhaskaran et al. (2020) concludes that firms with high performance in ESG aspects tend to create more value in the market. In this study, the results suggest that the Environmental and Governance performance enhance financial performance in BRIC countries. On the contrary, the Social performance has no significant effect on financial performance. Therefore, it is possible that whereas globally all three aspects of ESG are relevant, within the context of BRIC countries, this only applies to the Environmental and Governance performance. Liu et al. (2022) suggests that this could be due to the industrialization phase that the BRIC countries are undergoing which leads to heavy pollution and environmental impacts due to extensive use of fossil fuels and natural resource. Moreover, the BRIC countries results could differ from developed countries because they put economic priorities over the environment (Liuet al., 2022). Lastly, BRIC

countries play a key role in global supply chains, producing goods for export to developed countries. The BRIC countries bear the environmental costs of production, while consuming countries benefit from lower costs (Liu et al., 2022).

Thirdly, narrowing down the scope of this study, it is suggested that Environment performance has a significant positive effect on the financial performance for firms in Brazil. In a similar study on Brazil, Santis et al. (2016) find a strong link where ESG performance leads to better financial performance. However, in this study, for Russia, India and China, there was no significant effect of the E, S, G and ESG-combined performance indicators on financial performance. This is not in line with previous research on India and China. Xu and Zhu (2024) find that in China, high ESG performance is linked with improved financial performance. Moreover, Dalal and Thaker (2019) found a significant effect of ESG performance on financial performance in India. According to Liu et al. (2022), this could be caused by a difference in investor behaviour and perceived importance as mentioned before.]

Lastly, the interaction terms reveal that the social component of ESG scores significantly improved in its impact on firm value after the Paris Agreement in 2015 for the BRIC countries. This implies that the relationship between social performance and firm performance does positively change in a meaningful way after Paris Agreement. This is in line with the study by Gonçalves et al. (2023) which concluded a similarly improved social component of ESG scores in Europe. Both these findings are potentially related to the signing of the Paris Agreement (2015), which suggests that international treaties and policies influence firm decisions to focus on environmental and social impact, which moreover enhances their financial performance.

6. Conclusion

6.1 Purpose of study:

This thesis looks at the effect of Environmental, Social, and Governance (ESG) performance on financial performance across BRIC countries (Brazil, Russia, India, and China). Previous research has shown that ESG performance influences financial performance, however within the context of developing countries the relationship is weak. This study focuses on a subset within the developing countries, based on their characteristics. It aims to determine whether ESG performance correlates positively with financial performance in BRIC countries to provide valuable insights for investors and corporate leaders. Therefore, the research question that was studied in this thesis was: "For BRICS-countries, how does Environmental, Social, and Governance (ESG) performance effect financial performance and has the Paris Agreement (2015) contributed to this effect?"

6.2 Methods and Results:

To answer this question, ESG and financial data of 186 unique firms from 4 BRIC countries for a 10-year period was collected. Panel Data Regression was used to determine the relationship between E, S, G and ESG combined performance on financial performance, measured by Tobin's Q. Moreover, interaction terms were included to test whether a structural break in ESG-financial relationship occurs after the signing of the Paris Agreement (2015). The analysis shows that for BRIC countries a positive relationship can be found for the Environmental, Social, and Governance (ESG) performance indicators, where Environmental, and Governance performance are significant. Moreover, the Social-financial performance significantly improved after 2015, while the Environmental-financial and Governance-financial performance did not show notable change.

6.3 Findings:

This study concludes that by examining the BRIC countries as frontrunners of developing countries, there is a significant effect of ESG performance, primarily driven by the Environmental and Social components, on financial performance. This finding contrasts with previous research, which suggests that ESG performance does not significantly impact

financial performance in developing countries. This suggests that investing in BRIC firms with better ESG performance yields better financial performance. It can also be suggested that the BRIC countries provide an example for other developing countries, which implies that in the future, the effect of ESG performance on financial performance will become significant in other developing countries.

Implications for investors, corporate leaders, and policymakers

Based on the results of this research, firm's corporate leaders should focus on stakeholder theory (Freeman, 1984) rather than shareholder theory (Friedman, 1962) to appeal to investors. Prioritizing ESG investments and emphasizing Social and Governance initiatives can lead to financial benefits. Moreover, investors should demand ESG transparency and reporting of firms and incorporate ESG factors in their decision-making processes. Moreover, international treaties such as the Paris Agreement can potentially influence firm behaviour. Overall, investors, corporate leaders and policymakers can make more informed decisions that align with both financial performance and sustainability goals which drives long-term value and positive societal impact.

6.4 Limitations

This study comes with several limitations. First, the study focuses on the BRIC countries for which limited data was available. This caused problems since the samples were split into individual countries, and therefore each country has a smaller sample size, reducing the power of the statistical tests and making it harder to detect significant effects. This is especially the case when the effect of ESG is consistent but small across countries. Therefore, pooling the data increased the chance of detecting this effect as significant. Secondly, while country fixed effects control for unobserved, time-invariant characteristics, they do not control for time-varying idiosyncratic variations within each country. Thirdly, the study incorporated the control variables size and debt-ratio. However, there could be other relevant variables such as industry-specific factors that were not included but might influence the relationship between ESG performance and financial performance. Fourthly, the study focuses on firms from BRIC countries, which are leading emerging economies. The findings might not be applicable to other developing countries or regions with different economic and regulatory contexts. Lastly, although ESG scores

are widely used as indicators of sustainable practices, they often fall short because they do not fully integrate essential sustainability concepts. It would be interesting to observe what happens when ESG score is substituted for ESG rating, which is a blend of analysis and opinion.

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Appendix

Table 5

Regression results ESG-combined performance without interaction terms

Tobinsq_L	BRIC	Brazil	Russia	India	China
TRESGCS	0.0119***	0.0113***	0.00358	0.00738	0.00157
	(0.000)	(0.000)	(0.664)	(0.152)	(0.313)
Size	-0.473***	-0.340***	-0.182	-0.821***	-0.170***
	(0.000)	(0.000)	(0.055)	(0.000)	(0.000)
Debt-ratio	-2.593***	-1.638***	-0.0342	3.733***	-0.691***
	(0.000)	(0.000)	(0.944)	(0.000)	(0.000)
_cons	9.136***	6.230***	3.709*	15.76***	3.813***
	(0.000)	(0.000)	(0.019)	(0.000)	(0.000)
R-sq	0.261	0.282	0.020	0.397	0.394
Obs	1656	453	209	615	379

Note. Regression results using Panel Data Regression on dependent variable, Tobin's Q, based on 1656 observations from BRIC countries with independent variable ESG-combined. P-values in parentheses * p<0.05, ** p<0.01, *** p<0.001.

Table 6

Regression results E, S and G performance without interaction terms

Tobinsq_L	BRIC	Brazil	Russia	India	China
ENSCORE	0.000116	0.0156***	-0.00395	-0.0145**	0.00376**
	(0.961)	(0.000)	(0.627)	(0.005)	(0.003)
SOSCORE	0.00943***	0.00511	-0.000846	0.0262***	-0.00205
	(0.000)	(0.104)	(0.910)	(0.000)	(0.224)
CGSCORE	0.00517**	0.00455*	0.0118	0.00321	-0.00329**
	(0.007)	(0.045)	(0.058)	(0.399)	(0.003)
Size	-0.476***	-0.411***	-0.172	-0.824***	0.180***
	(0.000)	(0.000)	(0.084)	(0.000)	(0.000)

Debt-ratio	-2.574***	-1.838***	-0.343	-3.576***	0.817***
	(0.000)	(0.000)	(0.502)	(0.000)	(0.000)
_cons	8.980***	7.266***	3.432*	15.12***	4.035***
	(0.000)	(0.000)	(0.034)	(0.000)	(0.000)
R-sq	0.270	0.337	0.037	0.414	0.422
Obs	1656	453	209	615	379

Note. Regression results using Panel Data Regression on dependent variable, *Tobin's Q*, based on 1656 observations from BRIC countries with independent variables *Environmental, Social* and *Governance.* P-values in parentheses * p<0.05, ** p<0.01, *** p<0.001.

Table 7

Descriptive statistics Brazil, based on 236 observations

Variable	Mean	Std. dev.	Min	Max
Tobinsq_L	.8546676	1.031588	.0093809	8.119729
ENSCORE	53.21863	25.1438	.31	96.28
CGSCORE	55.84192	20.77251	9.32	95.11
SOSCORE	60.03953	20.84522	.87	95.6
TRESGCS	54.04313	18.52218	5.43	90.33
Size	15.845	1.416449	12.33458	20.12951
Debt-ratio	.3710682	.1885725	0	1.58189

Table 8

Regression results E, S, G and ESG-combined performance for Brazil without interaction terms

Tobinsq_L	(1)	(2)	(3)	(4)
TRESGCS	0.00249	0.0113***		
	(0.347)	(0.000)		
ENSCORE			0.00415	0.0156***

			(0.145)	(0.000)
SOSCORE			-0.00708	0.00511
			(0.057)	(0.104)
CGSCORE			0.00329	0.00455*
			(0.220)	(0.045)
Size		-0.340***		-0.411***
		(0.000)		(0.000)
Debt-ratio		-1.638***		-1.838***
		(0.000)		(0.000)
_cons	0.718***	6.230***	0.873***	7.266***
	(0.000)	(0.000)	(0.000)	(0.000)
R-sq	0.002	0.282	0.009	0.337

Note. Regression results using Panel Data Regression on dependent variable, Tobin's Q, based on 453 observations from Brazil with independent variables *Environment*, *Social*, *Governance and ESG-combined score.* P-values in parentheses * p<0.05, ** p<0.01, *** p<0.001.

Table 9

Descriptive statistics Russian Federation, based on 236 observations

Tobinsq_L	.8078066	1.757124	.0266889	25.62205
ENSCORE	42.93508	20.86719	.23	88.22
CGSCORE	49.5711	22.96821	5.34	95.57
SOSCORE	44.33492	22.8846	.37	87.4
TRESGCS	44.02547	16.49987	4.78	82.59
Size	16.78818	1.525828	11.85969	20.13232
Debt-ratio	.3402084	.2716459	0	1.616564

Table 10

Regression results E, S, G and ESG-combined performance for Russia without interaction terms

Tobinsq_L	(1)	(2)	(3)	(4)
TRESGCS	-0.00201	0.00358		
	(0.796)	(0.664)		
ENSCORE			-0.00647	-0.00395
			(0.415)	(0.627)
SOSCORE			-0.00378	-0.000846
			(0.602)	(0.910)
CGSCORE			0.0114	0.0118
			(0.051)	(0.058)
Size		-0.182		-0.172
		(0.055)		(0.084)
Debt-ratio		-0.0342		-0.343
		(0.944)		(0.502)
_cons	0.901*	3.709*	0.702	3.432*
	(0.017)	(0.019)	(0.064)	(0.034)
R-sq	0.000	0.020	0.023	0.037

Note. Regression results using Panel Data Regression on dependent variable, Tobin's Q, based on 209 observations from Russian Federation with independent variables *Environment, Social, Governance* score and ESG-combined. p-values in parentheses * p<0.05, ** p<0.01, *** p<0.001.

Table 11

Descriptive statistics India, based on 685 observations

Variable	Mean	Std. dev.	Min	Max
Tobinsq_L	1.795596	2.681109	.0017696	25.04351
ENSCORE	48.29584	24.20092	1.37	97.3
CGSCORE	52.41601	23.12292	.47	97.09
SOSCORE	57.95629	20.4128	5.38	95.87
TRESGCS	49.43988	17.15591	12.02	92.49
Size	16.08926	1.452452	13.05988	20.29384

DEBTRATIO	.30181	.250819	0	2.022832

Table 12

Regression results E, S, G and ESG-combined performance for India without interaction terms

Tobinsq_L	(1)	(2)	(3)	(4)
TRESGCS	0.0142*	0.00738		
	(0.029)	(0.152)		
ENSCORE			-0.0272***	-0.0145**
			(0.000)	(0.005)
SOSCORE			0.0290***	0.0262***
			(0.000)	(0.000)
CGSCORE			0.0182***	0.00321
			(0.000)	(0.399)
Size		-0.821***		-0.824***
		(0.000)		(0.000)
Debt-ratio		-3.733***		-3.576***
		(0.000)		(0.000)
_cons	1.051**	15.76***	0.431	15.12***
	(0.002)	(0.000)	(0.248)	(0.000)
R-sq	0.008	0.397	0.057	0.414

Note. Regression results using Panel Data Regression on dependent variable, Tobin's Q, based on 615 observations from India with independent variables *Environment, Social, Governance and ESG-combined score.* P-values in parentheses * p<0.05, ** p<0.01, *** p<0.001.

Table 13

Descriptive statistics China, based on 425 observations

Variable	Mean	Std. dev.	Min	Max

Tobinsq_L	.6236777	.5879876	.0230332	3.374412
ENSCORE	39.72673	23.5424	.38	90.8
CGSCORE	50.11381	23.18317	.9	91.56
SOSCORE	32.20553	18.78763	.64	85.71
TRESGCS	38.62313	16.55273	1.76	79.41
Size	17.21192	1.861644	13.14215	22.27771
Debt-ratio	.2617438	.1710315	0	.699197

Table 14

Regression results E, S, G and ESG-combined performance for India without interaction terms

Tobinsq_L	(1)	(2)	(3)	(4)
TRESGCS	-0.0105***	-0.00157		
	(0.0)	(0.313)		
ENSCORE			-0.00125	0.00376**
			(0.405)	(0.003)
SOSCORE			-0.00744***	-0.00205
			(0.000)	(0.224)
CGSCORE			-0.00187	-0.00329**
			(0.165)	(0.003)
Size		-0.170***		-0.180***
		(0.000)		(0.000)
Debt-ratio		-0.691***		-0.817***
				(0.000)
_cons	1.045***	3.813***	1.021***	4.035***
	(0.000)	(0.000)	(0.000)	(0.000)
R-sq	0.091	0.394	0.101	0.422

Note. Regression results using Panel Data Regression on dependent variable, Tobin's Q, based on 379 observations from China with independent variables *Environment, Social, Governance and ESG-combined score.* P-values in parentheses * p<0.05, ** p<0.01, *** p<0.001.

Table 15

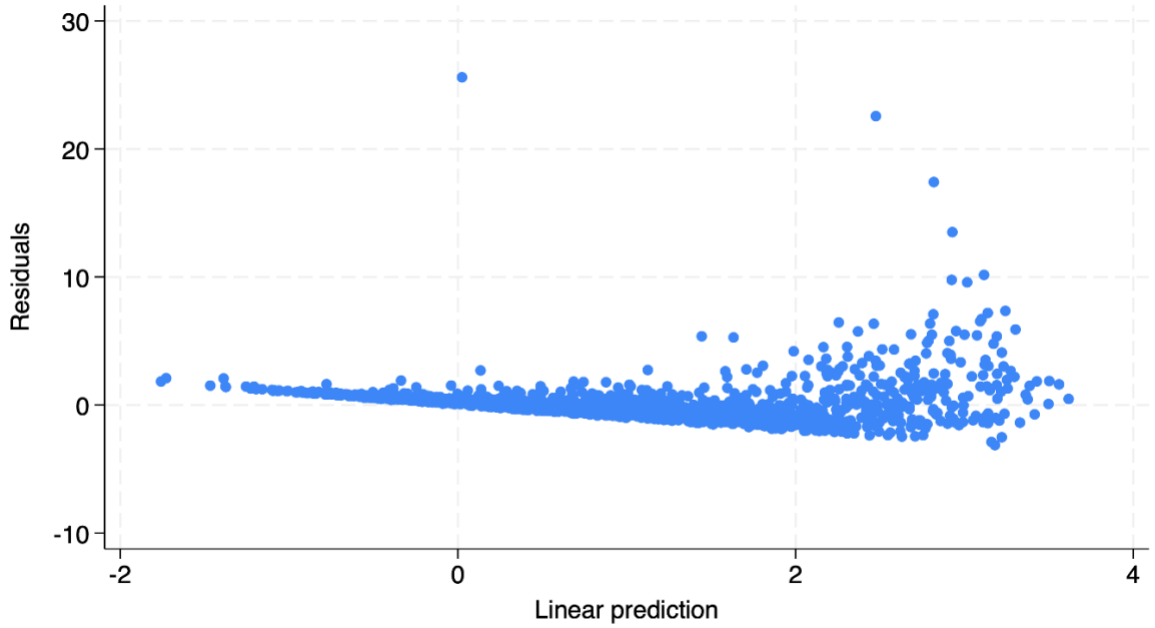
Multicollinearity

Variable	VIF	1/VIF
ENSCORE	1.99	0.503619
SOSCORE	1.95	0.512279
CGSCORE	1.14	0.873703
Size	1.12	0.896290
Debt-ratio	1.01	0.994312
Mean VIF	1.44	

Note. VIF stands for Variance Inflation Factor. The mean VIF across all variables is 1.44, which suggests that multicollinearity is not a significant concern in the data. The independent variables do not highly correlate with each other, which is good for the reliability of the regression results.

Figure 1

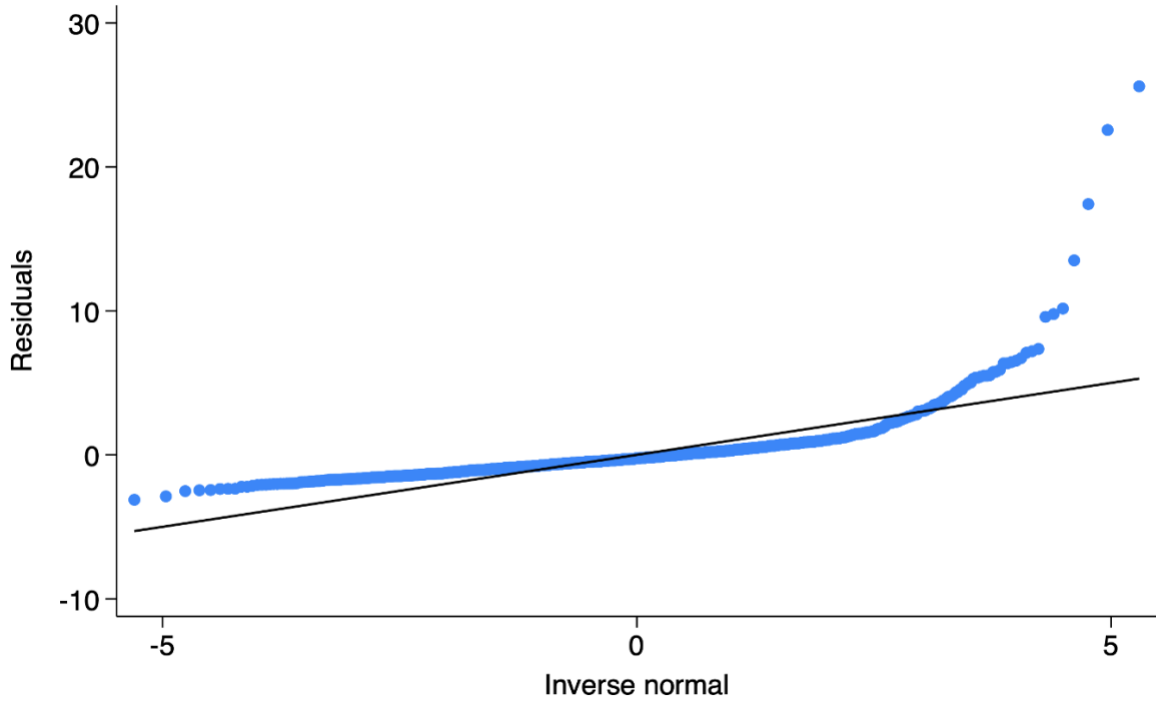
Residuals vs. Fitted Values



Note. This scatter plot shows the performance of the linear model. The presence of outliers and potential pattern in residuals warrant for adjustments to the model to improve its accuracy and reliability.

Figure 2

Normality of residuals



Note. This Q-Q plot indicates that the residuals of the model are not perfectly normally distributed, which may impact the assumptions. The presence of outliers and deviations from normality suggest that further investigation or adjustments to the model might be necessary to achieve a better fit.