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ESG in Developing Markets

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Abstract

This study explores the development of ESG practices of companies in Brazil, Russia, China and South Africa. The paper focuses on companies in the industrials, materials, energy and utilities industries. Through the lens of the financial metrics the paper investigates how ESG practices can be enhanced or compromised due to operational and economic conditions in these regions, which comprise of their own unique characteristics in contrast to developed markets. Analysing 154 companies between 2018 through 2023, an overall negative relationship was found between ESG scores and financial performance, particularly operating margin, net margin and return on equity.

Keywords:

ESG

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Industry Analysis

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Introduction:

Brazil, Russia, China and South Africa (BRICS) are increasingly important players in the in the global economy, making up 30% of the world's GDP and 42% of the world's population (Shah et al. 2022, 344). Regarding ESG practices, while they are large contributors of CO2 emissions – China emits 28% and Russia 5%, they have committed to bringing their emissions down (Shah et al. 2022, 343). South-Africa introduced a carbon tax law in 2019 to combat climate change and is a leader in the Middle East and Africa with sustainability reporting rates at 96% (Singhania and Saini 2023; KPMG 2020). Brazil's biodiversity and natural resources is leading sustainability to become an imperative point of discussion for Brazilian companies (Possebon et al. 2024). In China, energy consumption, wastewater, and emissions have decreased between 2018 and 2021, and labour union activities have increased (China Central Depository & Clearing Co. Ltd. and International Capital Markets Association 2023). Given these regions' prominent energy, industrials, utilities, and materials sectors, the role of these developing markets in ESG development requires further attention.

By incorporating ESG and sustainability initiatives into a company, this can positively impact operating financial performance. Implementing sustainability allows firms to enter new markets that seek sustainable products and services. ESG measures can enhance operational efficiency by reducing waste, and lower manufacturing costs through sustainable manufacturing processes such as material reuse and recycling. Energy consumption can be reduced through machinery and management systems that are energy-efficient, and using renewable energy sources (Singh 2024, 18-34). This is particularly important in energy-intensive industries like utilities, energy and industrials. Overall, these practices can lead to operational cost savings. By implementing sustainability measures to manage risk, firms will be less exposed to sanctions, reputational damage and legal recourse (Singh 2024, 18-34).

However, there are several challenges to implementing ESG initiatives, which can drive up operational costs. These are financial limitations from investments for new technology and training employees, resistance to change by staff and management, technological barriers and difficulty ensuring supply chain sustainability (Singh 2024, 18-34). These factors are exemplified in developing markets, making sustainability initiatives costlier in these regions compared to developed markets. The cost of capital is often higher in developing countries (Steffen 2020, 104795) due to economic instability and greater risk. Thus, seeking financing for ESG initiatives can be more expensive in developing countries. Finding low-carbon technologies is costlier for developing countries, due to importation from developed countries, and developing them leads to high research and development costs. ESG investments can be relatively more costly for firms in developing countries which can have lower revenues compared to firms in developed markets. Sourcing ESG-friendly suppliers can be challenging and expensive in developing countries due to a lack of regulatory oversight and transparency. Inflation, market volatility and currency fluctuations in these regions make long-term investments in ESG initiatives more expensive.

Understanding the relationship between ESG performance and operational financial performance requires an understanding of socio-economic factors in these regions to contextualise the findings. Understanding the opportunities and challenges in these areas can provide reasons behind ESG initiatives resulting in financial benefits or cost trade-offs for firms.

There is a divide between developed and emerging markets due to certain factors which influence the findings of ESG and financial performance in both these markets. Such factors include the regulatory environment, different stages of development, and economic volatility. Notably, developed countries have better enforcement of laws, enhanced information efficiency and more ESG-aware consumers (Strekalina et al. 2023). In emerging markets, the lack of

enforceable laws often results in a lack of accountability on businesses for their actions. Similarly, a lack of activism in these regions also results in businesses getting away with unethical behaviours (Strekalina et al. 2023, 99). These socio-economic factors can make it less desirable for companies in these regions to engage further in ESG initiatives.

In recent years, the COVID-19 pandemic increased climate change risk in developing countries rapidly, impacting the environmental performance of these companies (Singhania and Saini 2021). Russian companies still face challenges with ESG integration due to operating in carbon-intensive economies and their large role in exporting oil, gas, and coal (S&P Global 2021). ESG integration in these markets is challenging as these regions rely on fossil fuel production and are heavily dependent on carbon- and water-intensive industries and cheap energy sources for stakeholders. Lower education levels, smaller capital markets and inadaptable workforces contribute to challenges for ESG development in these regions (IMF 2021, 5). Another challenge that arises is inadequate ESG scoring frameworks which have been shown by research to lean towards benefitting developed countries due to greater income levels compared to developing countries (Gratcheva et al. 2021). In general, developing markets face greater difficulties in meeting the UN's Sustainable Development Goals, due to difficulties in accessing public and private financing to support companies' ESG initiatives (BNP Paribas 2023).

This thesis will look at whether there is a cost trade-off to implement ESG activities and sustainable investments in BRICS companies, focusing on operating margin, net margin, and return on equity metrics. Exploring recent economic and operational conditions in these regions offers contextual insight into the relationship found between ESG performance and financial performance. This helps to understand and provides explanations on whether implementing ESG initiatives in BRICS companies reaps financial benefits or leads to extra financial costs.

ESG:

Analysing ESG performance in these regions helps reveal its importance for companies and local economies. Investors increasingly consider the ESG practices of companies in their investment process decision. ESG practices can enhance the reputation of businesses, drive innovation, improve operational efficiencies, giving them a better foothold in capital markets, and thus improve the financial performance of companies (Bhaskaran et al. 2019). This supports local economies through fairer labour practices, appropriate governance practices, lower environmental emissions and draws consumers focus towards better ESG practices.

Two prominent theories related to ESG are stakeholder theory and legitimacy theory. These theories help understand ESG development in developing markets through the lens of financial performance of companies. Legitimacy theory is based on the belief that companies will provide their non-financial sustainability related information to fulfil their social contract which allows them to alleviate social and political pressure and enhance their reputation in consumers' eyes (Guthrie & Parker 1989; Tilling 2004). By not fulfilling the social contract, the theory posits that companies will suffer financially and reputationally (Guthrie & Parker 1989; Tilling 2004). Therefore, legitimacy theory emphasises the importance of companies fulfilling their societal duties and demonstrating their commitment to society, which can potentially increase financial performance. However, the extent to which a company fulfils this social contract depends on the economic context in which they operate. For example, in developing markets, consumers may prioritise cost minimisation over sustainability due to lower living standards. Consequently, firms may feel less obliged to maintain ESG practices, slowing down ESG progress in these regions.

Stakeholder theory believes that sustainability initiatives can improve the value of the firm and reputation. However, ESG initiatives require firms allocating resources towards these practices, which can conflict with the desires of other stakeholders, such as shareholders (Rezaee 2016). Nevertheless, the theory posits that management requires its business model and activities to

successfully implement sustainable performance in all aspects (Rezaee 2016; Donaldson & Preston 1995; Freeman 2010). Thus, when engaging in ESG initiatives, the conflicting desires of other stakeholders like the local government, policymakers, management, regulators or consumers can impact the effectiveness of a company's ability to enhance its ESG performance. This could be particularly the case in developing markets where stakeholders may prefer other objectives to be met such as wealth maximization and cost minimisation over ESG performance, impacting how quickly ESG initiatives evolve in these regions. Furthermore, the absence of comparable and standardised reporting requirements in these regions, coupled with market pressures like interest rate hikes in recent years and cost control requirements, may lead companies to deprioritise implementing impactful ESG initiatives in favour of pushing forth other stakeholders' interests. This can also result in investors lacking trust in ESG disclosures of companies for fear of greenwashing. This theory provides insight into understanding the relationship between ESG and operating financial performance in the context of the regions and stakeholder relationships.

Monitoring a firm's sustainability practices and ESG development can be done through its ESG scores, which are scoring metrics provided by external rating providers like Refinitiv and Bloomberg. ESG scores determine the strength of the ESG initiatives a company engages in. ESG scores consist of the environmental pillar (E-pillar), social pillar (S-pillar), and governance pillar (G-pillar). The governance pillar considers the strength of the information provided by a company regarding its shareholder rights, investor and stakeholder relationships, transparency regarding board diversity, payment and corruption. The social pillar details the initiatives regarding labour relationships, initiatives towards supporting the local community, gender and human rights and working conditions. The environmental pillar details how a company engages in reducing carbon emissions, disclosure of its environmental and climate information and risk management (Gesso and Lodhi 2023).

Literature Review

Role of ESG in Developing Markets:

Previous findings in developing markets are mixed and often show a statistically insignificant relationship. Looking at developing markets, a study on Latin American companies in between 2011-2015 found a statistically significant and negative relationship between ESG scores and return on assets (ROA), indicating that companies implementing ESG initiatives did not seem to reap financial benefits. A negative relationship was also found between financial performance and the environmental, social, and governance pillars (Duque-Grisales and Aguilera-Caracuel 2021). In other emerging markets, such as Malaysian firms, no statistically significant relationship was found between ESG performance and return on equity (ROE) during 2010-2013 (Atan et al. 2018). A study of 90 JSE-listed companies from 2012-2019 found a negative relationship between ESG performance and ROA, indicating that higher ESG performance does not necessarily improve accounting-based financial metrics (Ball 2021). This suggests that ESG practices may enhance market perceptions and investor confidence, in line with legitimacy theory, but showcases the limited influence on profitability in developing markets due to reasons discussed in the introduction.

ESG factors have also becoming increasingly important to China's economic development, requiring listed companies to focus more on ESG to enhance risk management, improve operational efficiency of enterprises and promote sustainable development (Ding et al 2023; Ding & Lee 2024). A study on Chinese manufacturing companies with high carbon footprints found that an increase in ESG scores led to an improved ROA (Ding & Lee 2024). However, the environmental pillar (E score) had a negative effect on financial performance. This may be due to higher operational costs associated with environmental governance and reducing carbon emissions (Ding & Lee 2024, 5058). A study by Possebon et al. (2024) showed that better ESG

practices were associated with lower costs of capital and improved ROA of publicly traded Brazilian companies. Only the environmental pillar score showed a statistically significant relationship with the cost of capital (Possebon et al. 2024).

However, another study which analysed public companies in the BRICS countries between 2017-2021 found that strong ESG ratings in these regions had a negative but statistically insignificant impact on ROA (Strekalina et al. 2023). Further research is required to discuss how the relationship between financial performance and ESG performance reflects more specifically recent operational and economic conditions through the lens of specific operational financial metrics such as operating margins, and whether there have been any significant changes in ESG development in recent years following COVID-19 and other events such as the Russia-Ukraine War. These factors provide contextual insight into understanding the relationship between ESG and operating performance observed in these regions. Furthermore, within these regions, further studies require a narrower focus on specific industries or sectors, which is necessary to investigate if the results are different on an industry-by-industry basis.

Developed markets:

A study which investigated the impact of ESG performance of companies in developed countries between 2010 and 2019 found that the impact on financial performance was higher for developed countries than emerging countries (Naeem et al. 2022). The paper found that the overall ESG performance had a positive relationship with ROE and Tobin's Q. Notably in developed countries, the separate pillars demonstrated positive impact on financial metrics like the environmental pillar on ROA (although statistically insignificant) and the ESG score and governance pillar score on ROE (Naeem et al. 2022). This emphasises the fact that the impact of ESG performance is more profound in developed markets, compared to developing markets.

Another study which examined the impact of ESG performance in companies in developed countries found a positive and significant association between ESG scores and valuation performance, notably ROE and Tobin's Q, whereas there was less impact in emerging market companies (Ting et al. 2019). Notably the developed market companies showed better valuation impact through its governance initiatives. The author notes that emerging and developed markets demonstrate differences. Emerging market companies face limitations due to state control, weaker governance initiatives and different cultural and social practices (Ting et al. 2019, 29). These factors effect financial outcomes in developing markets.

A study which analysed European companies demonstrated that companies in the energy sector with better ESG performance had better ROE (Koundouri et al. 2022). Research examining ESG and financial performance of S&P500 companies found that the ROE is higher for companies with higher ESG ratings in the utilities sector, but lower for the energy and materials sectors. In the industrial sector, only the G-score had a positive impact on ROE and Tobin's Q. The author posits that the financial benefits associated with environmental and social factors may take longer to be realised (Valerevna 2023). This can be due to the upfront investment costs associated with new technology or labour training. A study found that an increase in ESG controversy scores (environmental scandals and inappropriate social behaviour) led to a decline in company's ROE in environmentally sensitive industries (including energy, materials, utilities and industrials sectors) (Jucá et al. 2024). Specifically, within emerging markets, the ESG controversy score had no impact on the ROE, unlike firms in developed countries which experienced a reduction in ROE when their ESG controversy score increased. This might be due to the influence of media in more developed markets and the reputational damage linked with legal action (Jucá et al. 2024, 1313).

Research is required to explore the relationship between ESG and operating financial performance in BRICS companies in recent years. Further exploration is needed to see if recent

economic shifts, including the post-pandemic period and Russia-Ukraine war, have prompted companies in these regions to adopt ESG practices to enhance international market access, and how these economic changes impact ESG initiatives. Focus should be given on carbon-intensive industries - utilities, energy, materials and industrials- in these regions, where ESG's financial impact and development remains underexplored and inhibited due to specific characteristics of these industries. As global consumers increasingly prioritise sustainability, it is essential to assess if ESG initiatives adopted by companies in these regions yield financial benefits, or if economic conditions outweigh and limit potential benefits. Additionally, researching the delayed effect of ESG scores on financial performance by lagging ESG scores in studies can reveal long-term impact. This is because ESG performance may be slower to be reflected in financial metrics due to market volatility and operational limitations that exist in developing markets.

Industry Focus

The industrials, materials, utilities and energy sector are key sectors that enhance economic development in BRICS countries. ESG literature has deemed these industries as environmentally sensitive industries (Humphrey et al 2012; Henings & Kilian 2014; Miralles-Quirós et al 2018) This is because these industries tend to have higher environmental impact and higher carbon emissions. Consequently, they tend to have higher levels of environmental disclosure due to regulatory scrutiny and thus tend to have higher levels of reporting (Cormier and Magnan 2013; D'amico et al 2014; Matakanye, Van der Poll and Muchara 2021.) Additionally, research has shown that companies with high carbon emissions and high ESG performance have more resources at hand to respond to regulatory pressure (Zhao et al. 2018). Engaging in environmental practices could thus decrease their carbon footprint, leading to cost savings, and enhanced operational performance (Ding and Lee 2024, 5050).

These sectors drive economic growth, infrastructure development, and employment. Brazil's energy sector is extremely important as it is using renewable energy sources which has a central role in the country's economic growth. Russia relies on its gas and oil exports, and its materials industry, for economic growth. China is growing in the manufacturing and industrial sectors. South Africa is a major producer of minerals, with important mining and materials sectors needed for its economic stability.

Improving ESG practices in these sectors can drive sustainable growth in these markets, driving economic development. For example, through enhanced environmental practices like lowering pollution and reducing carbon emissions, this can lower pollution levels and increase energy efficiency, leading to lower usage of materials, increased energy efficiency, improved operational costs and can improve a company's ability to access sources of capital (Ting et al. 2019, 30). Firms investing into renewable energy can mitigate climate change in the local economy. Within the energy sector, ESG activities can support mining for energy sources with the least environmental impact and can support sourcing reliable and affordable energy sources (Al Hawaj and Buallay 2021, 64). Adopting socially responsible practices also enhances sustainable growth in these markets through engaging in fair labour practices, health and safety, and forming stronger relationships with the local communities and workers. This is especially important in industries such as mining and materials, where labour issues have been an area of concern in the past, and employment rights are essential to the running of these sectors. Improved labour practices can decrease labour costs, wrongful dismissal costs, and increase retention rates (Ting et al. 2019, 30). Strong governance practices such as enhanced ESG reporting and ethical practices will promote investor interest towards these sectors and regions, and can attract foreign direct investment into these regions, promoting stronger growth in these sectors. Engaging in governance practices creates more investment interest for foreign and domestic investors in these sectors, knowing they can rely on businesses which prioritise

business transparency and ethical governance practices. Increased investor interest also allows firms to access new investment sources to further their business operations and practices, allowing them to be more innovative and giving them a better competitive advantage in international markets.

However, these opportunities are not without obstacles. Opportunities for technology, training and new policy standards in these markets are impeded by the fact that they require great investment, with the cost of capital being higher in these markets compared to developed economies (Steffen 2020, 104795). These economies and industries are also greatly reliant on natural resource exports, thus adopting ESG initiatives may conflict with short-term economic objectives of the economies.

Hypothesis Development:

The role of ESG practices in influencing financial performance is complex and less conclusive in developing markets due to specific economic and regulatory challenges. The weaknesses in regulations, lack of economic development, and lower consumer activism in these regions could lead to lower integration of ESG initiatives and disclosures by companies in these regions and sectors. Greater investment risk in these markets from market volatility, war, possibility of corruption and inflation may lead to lower investment in these firms, lower adoption of ESG practices, and a lack of firm focus towards sustainable practices. In these 4 specific sectors studied in this paper, adopting ESG practices such as adopting renewable energy practices in the energy sector can have higher implementation costs that do not translate into financial benefits. Ambitions by other stakeholders to maximise profits can lead to other practices being neglected during periods of economic downturn, such as employee training and fair labour practices in the energy or industrials industries. Furthermore, a study conducted by Porter and Van der Linde (1995) found that the socially responsible investment (SRI) and financial

performance of a company is impacted by the level of economic development of a country, measured by factors like gross domestic product, industrialisation and standard of living. Thus, the opportunities and challenges highlighted in the introduction of this paper also reflect how financial improvements from ESG integration can be hindered or enhanced due to socio-economic factors.

A working paper by the International Monetary Fund (IMF) titled "Sustainable Finance in Emerging Markets: Evolution, Challenges, and Policy Priorities" distributed in September 2022 points out the trade off in emerging economies between choosing short-term growth or furthering environmental protection, and this divide has increased due to factors such as the COVID-19 pandemic (IMF 2021). The paper emphasises that developing markets may lack the budget to provide fiscal support for ESG practices, which was accentuated during COVID (IMF 2021). This factor may also make it harder for more stringent development of regulations in these regions, and companies may face difficulties importing technologies for ESG practices or to engage in partnerships with local governments to enhance ESG practices.

As a result of these factors, challenges may be presented which result in ESG initiatives not being implemented as quickly in these regions compared to the developed world, despite there being ample opportunities for implementation. Factors such as lower income, younger, and growing populations, and poor infrastructure also contribute to challenges for successful ESG integration (IMF 2021, 5). Given the challenges and previous findings in literature, the hypothesis explores whether ESG practices in these markets lead to long-term financial benefits or are constrained by short-term economic realities. In particular:

Hypothesis 1 (H1): ESG performance has a negative and/or insignificant effect on financial performance (operating margin, return on equity, net margin) in BRICS countries in the

industrials, energy, utilities and material sectors due to constraints by short-term economic realities.

Methodology:

Data collection

For this study, the data was collected from Refinitiv over a 6-year period (2018-2023). The data was collected from filtering for publicly listed companies in Brazil, Russia, South Africa, and China in the industrials, materials, energy and utilities sector. The necessary data gathered for each company was the ESG scores, environmental pillar scores, social pillar scores, governance pillar scores, return on equity (%), net margin (%), operating margin (%), market capitalisation, and total-debt to total-assets (%). Overall, the total number of companies which fit the criteria for the dataset were 154 companies: 23 Brazilian companies, 11 South African companies, 15 Russian companies, and 105 Chinese companies.

To investigate the relationship between operating margin, net margin and return on equity of these companies, which supports the question of exploring ESG development in these regions through the lens of operational financial metrics, it is necessary to conduct a panel ordinary least squares (OLS) regression model to estimate the relationship between the independent and dependent variables. All the regression models used firm fixed effects. The models controlled for firm fixed effects, represented as α_i, to enhance the robustness of the results, and to control for potential unobserved heterogeneity, enhancing the credibility of the findings.

For all the regression equations, 'accounting performance' is a general term used to represent operating margin or net margin or return on equity, depending on which of these financial metrics is being investigated in these regression analyses with respect to its relationships with the ESG scores and ESG pillar scores.

Regression Model Equations Set 1 and 2:

The regression equation used to investigate the relationship between ESG scores and operating financial performance is:

$$(1)\ Acounting\ performance_{it} = \beta 0 + \beta 1 ESGscore_{it} + \beta 2 Debt_{it} + \beta 3 MarketCap_{it} + \alpha_i + \epsilon_{it}$$

The regression equation used to investigate the relationship between ESG pillar scores and operating financial performance is:

$$(2)\ Accounting\ Performance_{it} = \beta 0 + \beta 1 EnvironmentalPillarScore_{it} + \beta 2 SocialPillarScore_{it} + \beta 3 GovernancePillarScore_{it} + \beta 4 Debt_{it} + \beta 5 MarketCap_{it} + \alpha_i + \epsilon_{it}$$

Regression Model Equations to Lag ESG scores by 1,2, and 3 Years:

A 1-, 2-, and 3-year lag to ESG scores was applied in these regression analyses to observe how prior ESG performance influences financial metrics over time. These lags account for delayed impacts due to factors like political pressures, currency depreciation, inflation, and operational challenges which have been central in these regions between 2018 and 2023, and which may obscure immediate financial outcomes from ESG activities. By allowing a period for market conditions to stabilise, this approach reveals effects of earlier ESG efforts on profitability and operational efficiency after the market has had time to adjust.

$$(3)\ Accounting\ Performance_{it} = \beta 0 + \beta 1 ESGscore_{it-x} + \beta 2 Debt_{it} + \beta 3 MarketCap_{it} + \alpha_i + \epsilon_{it}$$

Where 'x' represents a 1-, 2-, or 3-year lag in the ESG scores.

Regression Model Equations to Lag ESG Pillar Scores by 1,2, and 3 years:

For similar reasons as before, in the next regression set, the environmental, social, and governance pillar scores were lagged by 1, 2, and 3 years.

(4) $Accounting\ Performance_{it}$

$$= \beta 0 + \beta 1 EnvironmentalPillarScore_{it-x} + \beta 2 SocialPillarScore_{it-x}$$
$$+ \beta 3 GovernancePillarScore_{it-x} + \beta 4 Debt_{it} + \beta 5 MarketCap_{it} + \alpha_i + \epsilon_{it}$$

Where x represents a 1-, 2-, or 3-year lag in the pillar scores.

Industry Analysis:

An industry-by-industry analysis was conducted for the industrials, utilities, materials, and energy industries. The purpose of this is to investigate the relationship between ESG performance and operating financial performance of companies per industry. This provides insight into how the relationship varies on an industry-by-industry basis and whether a stronger correlation is found in a specific industry. To conduct the industry analysis, the companies were divided by their respective industries. Once the companies were divided into their industries, the same regression equations that were used to conduct regressions set 1 and 2 (specifically equation 1 and 2 above) were used for each of the 4 industries. This tests the relationship between ESG scores and the financial metrics, and ESG pillar scores and the financial metrics. Engaging in industry analyses provides useful insight for firms and policy makers to understand what impact environmental, social, and governance factors will have on the financial performance metrics in the specific industries.

Control Variables

Market capitalisation is used as a control variable to account for firm size, and total debt to total assets is used as a control variable for leverage. Firm size accounts for economies of scale, resource allocation, and access to capital. For example, larger firms will face more public attention and pressure to behave more sustainably and will have a larger market position, as measured by market capitalisation, and thus will be more inclined to engage in ESG activities (Lourenço and Branco 2013, 136). Higher leverage can lead to financial instability and weaker

financial performance (Luo et al. 2024, 5417). This can make it harder for firms to allocate resources towards ESG practices. Using these control variables is in line with other papers that have used firm size and firm leverage as control variables when investigating the impact of ESG on financial performance (Luo et al. 2024; Garcia et al 2017; Duque-Grisales and Caracuel 2021).

Results and Discussion of Financial Performance Behaviour in these Regions:

The following section discusses the notable results found from the regression analyses and discusses the behaviour of the financial performance metrics within these regions. This provides a contextual analysis for the relationship between ESG and financial performance, offering further insight into the development of ESG in these countries. The ESG score results and the most notable pillar score results will be shown in the tables below and discussed, while all the other pillar score results from the regression analyses will be shown in the appendix.

Regressions Set 1 and 2 (Not Lagged):

Table 1: ESG scores and Pillar Scores for Regressions Set 1 and 2

Regressions Set 1: ESG Score Results (Not Lagged)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
ESG Score	-0.0380	0.216	ESG Score	-0.054	0.1242	ESG Score	0.0285	0.6528
Debt (ESG Score)	-0.2885	4E-04	Debt (ESG Score)	-0.2687	0.0004	Debt (ESG Score)	-0.3388	0.021
Market Cap (ESG Score)	0.1256	0	Market Cap (ESG Score)	0.0457	0	Market Cap (ESG Score)	0.6484	0

Regression Set 2: Notable Pillar Score Results (Not Lagged)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0748	0.053	Environmental Pillar Scor	-0.0461	0.1862	Environmental Pillar Score	-0.0034	0.9448

Lagged Effects of ESG and Pillar Scores by 1, 2, and 3 Years:

Table 2: ESG and Pillar Scores Lagged by 1 year

ESG Scores Lagged by 1 Year								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
ESG Score	-0.0488	0.176	ESG Score	-0.0403	0.1428	ESG Score	-0.0119	0.8463
Debt (ESG Score)	-0.3363	0	Debt (ESG Score)	-0.244	0.0002	Debt (ESG Score)	-0.3525	0.0497
Market Cap (ESG Score)	0.1496	0	Market Cap (ESG Score)	0.0472	0	Market Cap (ESG Score)	0.6589	0

ESG Pillar Scores Lagged by 1 Year (Notable Pillar Score Results)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0794	0.044	Environmental Pillar Score	-0.0324	0.3961	Environmental Pillar Score	-0.0184	0.8168

Table 3: ESG and Pillar Scores Lagged by 2 Years

ESG Scores Lagged by 2 Years								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
ESG Score	-0.0310	0.576	ESG Score	-0.0416	0.1548	ESG Score	-0.0991	0.1508
Debt (ESG Score)	-0.2923	0.01	Debt (ESG Score)	-0.2325	0.0007	Debt (ESG Score)	-0.2994	0.1368
Market Cap (ESG Score)	0.1572	0	Market Cap (ESG Score)	0.02	0	Market Cap (ESG Score)	0.563	0

ESG Pillar Scores Lagged by 2 Years (Notable Pillar Score Results)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0981	0.032	Environmental Pillar Score	-0.0596	0.0838	Environmental Pillar Score	-0.1537	0.0322

Table 4: ESG and Pillar Scores Lagged by 3 Years

ESG Scores Lagged by 3 Years								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
ESG Score	-0.1942	0.0348	ESG Score	-0.1081	0.0424	ESG Score	-0.5003	0.0001
Debt (ESG Score)	-0.068	0.5917	Debt (ESG Score)	-0.126	0.0568	Debt (ESG Score)	0.19	0.3774
Market Cap (ESG Score)	0.1256	0	Market Cap (ESG Score)	0.0457	0	Market Cap (ESG Score)	1.1366	0

ESG Pillar Scores Lagged by 3 Years (Notable Pillar Score Results)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0671	0.3588	Environmental Pillar Score	-0.0447	0.2541	Environmental Pillar Score	-0.1994	0.087

As demonstrated by the main findings when the ESG scores were lagged by 1, 2, and 3 years, it takes time for the ESG initiatives to be reflected in financial performance. However, statistically significant results start to appear only once the ESG scores are lagged by 2 years. Notably, the environmental pillar score lagged by 2 years has a statistically significant and negative impact on operating margin (-0.0981, p-value: 0.032) and for ROE (-0.1537, p-value: 0.0322). The most statistically significant results are found when the ESG scores were lagged by 3 years. All lagged results show negative coefficients for the ESG and pillars scores, indicating a negative relationship between ESG pillar scores and financial metrics.

When the ESG scores were lagged by 3 years, the results show a statistically significant and negative relationship with operating margin, net margin, and return on equity in these regions. For the 3-year lag, a one-unit increase in the ESG score is associated with a 0.1942 percentage point decrease in operating margin, a 0.1081 percentage point decrease in net margin, and a 0.5003 percentage point decrease in ROE. This indicates that for the average firm, ESG-friendly initiatives may increase operational costs through investments, training, and sourcing sustainable suppliers, which leads to a decrease in margins. While these percentage point decreases may have a minor effect on larger firms' margins, for smaller firms focusing on cost

minimisation and wealth increase in these regions, they may be deterred from engaging in ESG practices for fear of the extra costs and lower margins. From the 3-year lag results, the strongest decrease is for ROE (coefficient of -0.5003). This indicates that ESG activities can reduce returns for shareholders in the medium term in developing markets. Thus, ESG practices might have slower progression in these markets due to shareholder conflict, as they may fear the potential of lower returns, in line with stakeholder theory.

Lagging the ESG scores demonstrates that the financial outcomes of ESG practices will usually manifest after a period, to allow for the ESG scores to take effect, hence the statistically significant results. For example, it may take time for the investment in ESG initiatives such as technology upgrades, employee training or compliance systems to be reflected in financial performance, and the results become more prominent after a few years. Adopting environment practices such as cleaner technologies or complying with regulations can increase costs for companies, especially in the short-term. This is particularly the case in developing markets, where importing the necessary equipment can be expensive.

These findings are in line with Duque-Grisales and Aguilera-Caracuel (2021) and Strekalina et al. (2023) who found a negative relationship between ESG performance and financial performance in developing markets. However, these studies conducted their research using data from older years compared to this thesis, and did not lag the ESG and ESG pillar scores. These papers looked at different markets such as Latin American countries, used different financial metrics, and did not apply an industry-by-industry analysis, which was done in this thesis.

Interestingly, these results are inconsistent with another study on 22 emerging market countries which found that all three pillars of the ESG score enhanced both ROA and Tobins' Q. However, the positive effect of ESG performance on these metrics was for companies with greater institutional ownership (Bilyay-Erdogan and Ozturkkalwh 2023). Therefore, this suggests state

ownership plays a large factor in ESG development in developing markets, as institutional backing may provide resources for ESG investments without risking financial performance. Furthermore, these companies may align more closely with regulations and demonstrate stronger governance due to state influence.

The exchange rate fluctuations, economic and operational conditions, and market volatility in these regions can impact the costs and benefits that come with ESG practices. For example, a report by the South African Reserve Bank highlights that inflation was still high at around 5-6% in 2023 (despite coming down from 8.7% in 2022). Increasing costs in services, food, electricity, and currency depreciation are further impacted due to internationally high interest rates. Furthermore, South Africa's GDP growth was projected to remain below COVID levels and inflation remained high due to difficulties in energy price inflation and supply, decreased logistical capacity, decreasing commodity export prices, and poor confidence from businesses and households (South African Reserve Bank 2024). In Brazil, public debt remained high before and after the pandemic, increasing by the end of 2020 (OECD 2023), which can impact a company's ability to seek debt financing. Inflation concerns were still rampant throughout the period due to fluctuations in the global market, impacting operational costs and performance of these companies (OECD 2020). For companies investing in ESG, changes in these conditions can increase the costs of ESG initiatives and may delay the financial benefits from ESG practices being realised due to the volatility of the conditions.

More recently, Russia was imposed with sanctions following the Ukraine invasion in February 2022. These sanctions can increase operational costs for companies because of inaccessibility to markets, supply chain disruptions, and reduced revenues. This can have a knock-on effect on ESG performance, as Russian companies will be struggling to maintain profitability margins and costs amidst economic pressure, fluctuating commodity prices, and market volatility.

Companies might have difficulty sourcing ESG-compliant equipment and may also reduce ESG reporting due to less interaction with investors during this period.

In 2022, the zero-COVID policy in China following the resurgence isolated the country, restricting imports, causing supply chain disruptions and increasing costs in manufacturing, utilities and energy due to the yuan's devaluation, making imports of raw materials like oil or gas more expensive. Unexpected events like this challenge ESG integration, as compliance with standards such as labour practices and governance standards, and sustainable sourcing become more expensive, impacting operating profitability. Furthermore, the yuan's devaluation makes it more difficult for a company to seek debt to finance ESG projects. These factors may explain delayed financial outcomes from ESG initiatives and why companies engaging in ESG initiatives can experience lower financial performance, as higher costs, inflation, and slow growth override ESG benefits.

Industry Analysis Results:

Table 5: Results For Utilities Industry

Utilities Industry (ESG Scores)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-Value		Coefficient	P-Value		Coefficient	P-Value
ESG Score	-0.1364	0.012	ESG Score	-0.1449	0.1309	ESG Score	-0.0908	0.1088
Debt (ESG Score)	0.0554	0.7679	Debt (ESG Score)	-0.3972	0.2448	Debt (ESG Score)	-0.3064	0.0027
Market Cap (ESG Score)	-307.37	0.3108	Market Cap (ESG Score)	-360.2	0.3313	Market Cap (ESG Score)	-161.27	0.572

Utilities Industry (Notable Pillar Score Results)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.1009	0.361	Environmental Pillar Score	-0.0811	0.5065	Environmental Pillar Score	0.0134	0.8446

For the utilities industry, the results demonstrate a negative relationship between ESG scores and all 3 financial metrics, as shown per the table above. However, only the relationship between operating margins and ESG scores is statistically significant (coefficient: -0.1364, p-value: 0.012). The strongest negative relationship for the pillar scores was between the environmental pillar score and operating margin (coefficient: -0.1009, p-value: 0.361).

Table 6: Results for Materials Industry

Materials Industry (ESG Scores)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-Value		Coefficient	P-Value		Coefficient	P-Value
ESG Score	0.0135	0.8462	ESG Score	0.0239	0.442	ESG Score	0.1593	0.314
Debt (ESG Score)	-0.2845	0.21	Debt (ESG Score)	-0.204	0	Debt (ESG Score)	-0.2286	0.4878
Market Cap (ESG Score)	0.126	0.0019	Market Cap (ESG Score)	0.0477	0	Market Cap (ESG Score)	0.6575	0

Materials Industry (Notable Pillar Score Results)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Social Pillar Score	0.1723	0.1042	Social Pillar Score	0.0247	0.6423	Social Pillar Score	0.3356	0.1569

For the materials industry, the results show a positive and closely significant relationship between the social pillar score and operating margin (coefficient: 0.1723, p-value 0.1042). This finding is in line with legitimacy theory, reflecting the idea that companies will disclose societal commitments for reputational benefit and improved perception in consumer's eyes.

Table 7: Results for Industrials Industry

Industrials Industry (ESG Scores)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-Value		Coefficient	P-Value		Coefficient	P-Value
ESG Score	-0.0532	0.0735	ESG Score	-0.0729	0.442	ESG Score	-0.0316	0.314
Debt (ESG Score)	-0.3841	0.0006	Debt (ESG Score)	-0.349	0.0415	Debt (ESG Score)	-0.4529	0.0002
Market Cap (ESG Score)	22.746	0.0248	Market Cap (ESG Score)	20.2	0.0211	Market Cap (ESG Score)	46.214	0.0246

Industrials Industry (Notable Pillar Score Results)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0793	0.0562	Environmental Pillar Score	-0.0899	0.1821	Environmental Pillar Score	-0.0398	0.3456

For the industrials industry, the results show a negative relationship between ESG scores and all 3 metrics, the closest to statistical significance being with operating margin. For operating margin, there was a negative and closely significant relationship found with the environmental pillar score (coefficient: -0.0793, p-value: 0.0562). Companies should consider that environmental activities in the utilities and industrials industries might require a longer period for them to positively benefit financial performance particularly in these countries due to operational issues. For example, a report by the OECD on Brazil demonstrated that the country has poor infrastructure with low investment, and logistical bottlenecks (OECD survey 2023).

Table 8: Results for Energy Industry

Energy Industry (ESG Scores)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-Value		Coefficient	P-Value		Coefficient	P-Value
ESG Score	0.0150	0.8983	ESG Score	-0.007	0.893	ESG Score	-0.0394	0.7822
Debt (ESG Score)	-0.3099	0.2446	Debt (ESG Score)	-0.1355	0.2388	Debt (ESG Score)	-0.3124	0.0986
Market Cap (ESG Score)	0.3943	0.2813	Market Cap (ESG Score)	0.0236	0.899	Market Cap (ESG Score)	-0.3219	0.4396

Energy Industry (Notable Pillar Score Results)								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Governance Pillar Score	-0.1441	0.1622	Governance Pillar Score	-0.0664	0.0376	Governance Pillar Score	-0.1418	0.0586
Environmental Pillar Score	0.0628	0.6368	Environmental Pillar Score	0.0602	0.1758	Environmental Pillar Score	0.2091	0.0306

Within the energy industry, the environmental pillar score has a positive and statistically significant relationship with return on equity (coefficient: 0.2091, p-value: 0.0306), meaning that a 1-unit increase in the environmental pillar score is correlated with a 0.2091 percentage point increase in ROE for the average firm. This reflects the importance of a firm's environmental performance for profitability and enhanced investor perception. A negative and statistically significant relationship was found between governance scores and net margin (coefficient: -0.0664, p-value: 0.0376). Thus, an increase in a governance score for an average firm is correlated with a 0.0664 percentage point decrease in net margins. For these firms, creating governance protocols and standards, training management, and implementing anticorruption procedures can be costly, impacting operating profitability and margins for firms. Overall, this is an interesting finding which can be applied to the example of a Russian company. Rusal, an aluminium producer which had low carbon emissions was sanctioned by the U.S. Office of Foreign Assets Control (OFAC) in 2018 due to corporate governance issues, particularly due to a controlling shareholder (S&P Global 2021). While the company demonstrated a positive environmental initiative through its use of carbon-free hydropower, it was still sanctioned for its governance issues, significantly impacting its financial performance. Companies with poorer governance issues can suffer high costs of capital from increased company management risk, impacting operational financial performance.

Overall, these findings from an industry analysis are somewhat consistent with a paper by Yoon et al. (2018) which found that between 2010 and 2015, ESG initiatives did not lead to better

financial results for Korean companies in environmentally sensitive companies compared to non-environmentally sensitive companies. These findings are also consistent with a paper which investigated the relationship of ESG performance in companies operating in sensitive industries (those considered as moral taboos like tobacco, weapons and gambling) in BRICS between 2010 and 2012, and found that stronger environmental performance was correlated with reduced profitability, having analysed free cash flow (Garcia et al. 2017).

Conclusion and Further Research:

This paper contributes towards exploring the relationship between ESG performance and operational financial performance in BRICS countries in the industrials, utilities, energy, and materials industries between 2018 and 2023. The main findings from this paper are that ESG practices, analysed through ESG scores, have a negative impact on operating margin, net margin, and return on equity. Within the industries analysed, similar negative relationships were also found. These findings reflect the fact that factors such as inflation, currency depreciation, the COVID-19 pandemic, logistical difficulties, consumer behaviour and weaker regulations can impact effective ESG integration for companies. These operational and economic conditions play a larger part in how ESG is integrated in these markets. Based on the conditions of these regions, companies may be focusing on engaging in cost-cutting measures to combat currency depreciation or inflation. Whilst still implementing ESG activities, supply chain issues, consumer beliefs, and the economic and operational background can overtake any financial benefits arising from these activities in the short term.

However, as the ESG impacts are delayed by several years, investors could incorporate a longer-term investment strategy for companies in these regions. Investors may receive financial benefits over a longer period once there is lower market volatility in these regions. As this study focused on industries which are capital-intensive, require many logistical operations, and have

high emissions, investors could use the findings from this study to diversify their portfolio into other sectors such as healthcare or technology, to counteract any negative financial benefits arising from these industries studied. This helps to create a more balanced portfolio. Furthermore, investors could seek financial support or partnerships to help mitigate the costs and offer support for funding the capital expenditure required for environmentally friendly projects in the short-term for these firms.

For policymakers, a mandatory, comparable and standardised ESG reporting framework should be adopted in these regions, to enhance transparency, encourage ESG development, and reduce greenwashing concerns. To encourage compliance and to support the local economies of these industries, governments could offer tax incentives and subsidies to support companies' ESG initiatives. Offering incentives can help firms incorporate ESG initiatives without impacting short-term profitability and operational efficiency. This would be crucial in capital-intensive industries such as the ones studied in this paper, which require high up-front investments. For example, the People's Bank of China recently offered resources to subsidise loans that offer support to decarbonisation sectors (Scatigna et al. 2021). For governance concerns, policymakers can help establish more precise corporate governance standards that companies can follow to attract capital and increase investor confidence in the future in these regions.

This study on developing markets faced limitations due to data availability and quality in these regions, limiting the analysis period. Future research could address this by using data from other reliable sources and in other years, expanding the sample size, and investigating other industries to assess variations across industries. Additionally, extending the analysis beyond the COVID-19 pandemic to periods of lower market volatility and greater stability could provide further insights into the long-term effects of ESG on financial performance in these regions studied.

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Appendix:

Table 1: Regression Set 2 – All Pillar Score Results (Not Lagged):

Regressions Set 2- All Pillar Score Results (Not Lagged)									
	Operating Margin			Net Margin			Return on Equity		
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0748	0.053	Environmental Pillar Score	-0.0461	0.1862	Environmental Pillar Score	-0.0034	0.9448
Social Pillar Score	0.0491	0.345	Social Pillar Score	-0.0155	0.5852	Social Pillar Score	0.061	0.4494
Governance Pillar Score	-0.0161	0.535	Governance Pillar Score	-0.0038	0.7819	Governance Pillar Score	-0.0238	0.5296
Debt (Pillar Score)	-0.2891	4E-04	Debt (Pillar Score)	-0.2706	0.0005	Debt (Pillar Score)	-0.3354	0.0218
Market Cap (Pillar Score)	0.1246	0	Market Cap (Pillar Score)	0.0449	0	Market Cap (Pillar Score)	0.649	0

Table 2: All Pillar Score Results Lagged by 1 Year:

ESG Pillar Scores Lagged by 1 Year -All Pillar Score Results									
	Operating Margin			Net Margin			Return on Equity		
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0794	0.044	Environmental Pillar Score	-0.0324	0.3961	Environmental Pillar Score	-0.0184	0.8168
Social Pillar Score	0.0325	0.5297	Social Pillar Score	-0.0205	0.6249	Social Pillar Score	-0.0251	0.8372
Governance Pillar Score	-0.0003	0.992	Governance Pillar Score	0.0019	0.9014	Governance Pillar Score	0.0297	0.4592
Debt (Pillar Scores)	-0.338	0.00	Debt (Pillar Scores)	-0.2456	0.0002	Debt (Pillar Scores)	-0.3561	0.0462
Market Cap (Pillar Scores)	0.1479	0	Market Cap (Pillar Scores)	0.0453	0	Market Cap (Pillar Scores)	0.6821	0

Table 3: All Pillar Score Results Lagged by 2 Years:

ESG Pillar Scores Lagged by 2 Years -All Pillar Score Results									
	Operating Margin			Net Margin			Return on Equity		
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0981	0.032	Environmental Pillar Score	-0.0596	0.0838	Environmental Pillar Score	-0.1537	0.0322
Social Pillar Score	0.0363	0.6385	Social Pillar Score	0.0222	0.5868	Social Pillar Score	0.0253	0.8252
Governance Pillar Score	0.0478	0.1543	Governance Pillar Score	-0.0079	0.6266	Governance Pillar Score	0.0318	0.5145
Debt (Pillar Scores)	-0.2901	0.01	Debt (Pillar Scores)	-0.2316	0.0007	Debt (Pillar Scores)	-0.2968	0.1425
Market Cap (Pillar Scores)	0.1568	0	Market Cap (Pillar Scores)	0.0206	0	Market Cap (Pillar Scores)	0.5628	0

Table 4: All Pillar Score Results Lagged by 3 Years:

ESG Pillar Scores Lagged by 3 Years -All Pillar Score Results									
	Operating Margin			Net Margin			Return on Equity		
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0671	0.3588	Environmental Pillar Score	-0.0447	0.2541	Environmental Pillar Score	-0.1994	0.087
Social Pillar Score	-0.1377	0.2303	Social Pillar Score	-0.0743	0.2508	Social Pillar Score	-0.3404	0.0756
Governance Pillar Score	-0.0584	0.2094	Governance Pillar Score	-0.026	0.2763	Governance Pillar Score	-0.1118	0.1544
Debt (Pillar Scores)	-0.0691	0.587	Debt (Pillar Scores)	-0.1267	0.0568	Debt (Pillar Scores)	0.1866	0.3908
Market Cap (Pillar Scores)	0.147	0	Market Cap (Pillar Scores)	0.0806	0	Market Cap (Pillar Scores)	1.1316	0

Table 5: All Pillar Score Results from Utilities industry:

Utilities Industry - All Pillar Score Results									
	Operating Margin			Net Margin			Return on Equity		
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.1009	0.361	Environmental Pillar Score	-0.0811	0.5065	Environmental Pillar Score	0.0134	0.8446
Social Pillar Score	-0.0542	0.6491	Social Pillar Score	-0.1418	0.1065	Social Pillar Score	-0.0716	0.3234
Governance Pillar Score	-0.012	0.8088	Governance Pillar Score	0.0488	0.4156	Governance Pillar Score	-0.0584	0.3438
Debt (Pillar Scores)	0.048	0.7917	Debt (Pillar Scores)	-0.4282	0.2227	Debt (Pillar Scores)	-0.2991	0.0036
Market Cap (Pillar Scores)	-323.83	0.2921	Market Cap (Pillar Scores)	-416.1	0.238	Market Cap (Pillar Scores)	-143.91	0.5805

Table 6: All Pillar Score Results from Materials Industry:

Materials Industry - All Pillar Score Results									
	Operating Margin			Net Margin			Return on Equity		
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.1044	0.2443	Environmental Pillar Score	-0.0013	0.9778	Environmental Pillar Score	-0.0719	0.6539
Social Pillar Score	0.1723	0.1042	Social Pillar Score	0.0247	0.6423	Social Pillar Score	0.3356	0.1569
Governance Pillar Score	-0.0389	0.42	Governance Pillar Score	0.0099	0.7153	Governance Pillar Score	-0.0532	0.529
Debt (Pillar Scores)	-0.2633	0.0256	Debt (Pillar Scores)	-0.2035	0	Debt (Pillar Scores)	-0.1891	0.5385
Market Cap (Pillar Scores)	0.1252	0	Market Cap (Pillar Scores)	0.0474	0	Market Cap (Pillar Scores)	0.6576	0

Table 7: All Pillar Score Results from Industrials Industry:

Industrials Industry - All Pillar Score Results								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	-0.0793	0.0562	**Environmental Pillar Score**	-0.0899	0.1821	**Environmental Pillar Score**	-0.0398	0.3456
Social Pillar Score	0.0017	0.9737	**Social Pillar Score**	0.0216	0.5725	**Social Pillar Score**	-0.0193	0.7634
Governance Pillar Score	0.0319	0.2148	**Governance Pillar Score**	-0.0094	0.7228	**Governance Pillar Score**	0.0306	0.4447
Debt (Pillar Scores)	-0.3922	0.0004	**Debt (Pillar Scores)**	-0.3604	0.0451	**Debt (Pillar Scores)**	-0.455	0.0002
Market Cap (Pillar Scores)	25.328	0.0144	**Market Cap (Pillar Scores)**	21.292	0.0162	**Market Cap (Pillar Scores)**	48.299	0.0206

Table 8: All Pillar Score Results from Energy Industry:

Energy Industry - All Pillar Score Results								
	Operating Margin			Net Margin			Return on Equity	
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Environmental Pillar Score	0.0628	0.6368	**Environmental Pillar Score**	0.0602	0.1758	**Environmental Pillar Score**	0.2091	0.0306
Social Pillar Score	0.2128	0.2851	**Social Pillar Score**	0.0547	0.3144	**Social Pillar Score**	0.0135	0.9226
Governance Pillar Score	-0.1441	0.1622	**Governance Pillar Score**	-0.0664	0.0376	**Governance Pillar Score**	-0.1418	0.0586
Debt (Pillar Scores)	-0.3021	0.2642	**Debt (Pillar Scores)**	-0.1348	0.2567	**Debt (Pillar Scores)**	-0.318	0.0958
Market Cap (Pillar Scores)	0.682	0.0836	**Market Cap (Pillar Scores)**	0.183	0.3256	**Market Cap (Pillar Scores)**	0.0762	0.8339

Table 9: Residuals and Fitted Values for Operating Margin

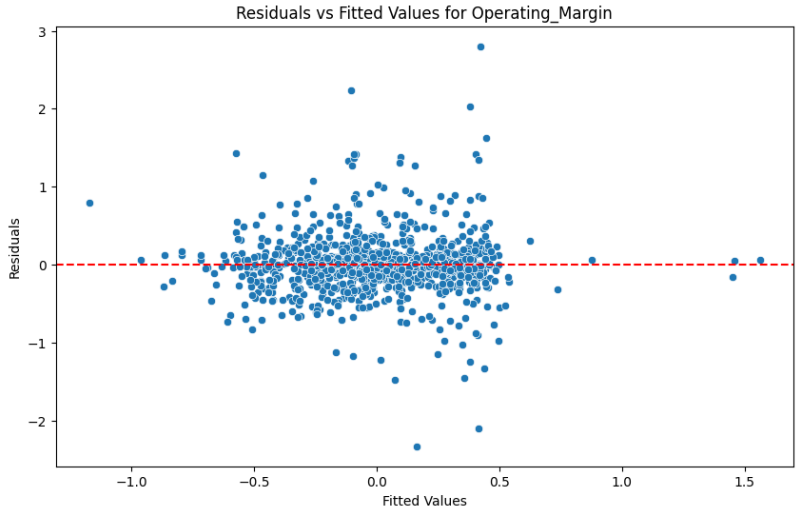

Table 10: Residuals And Fitted Values for Net Margin:

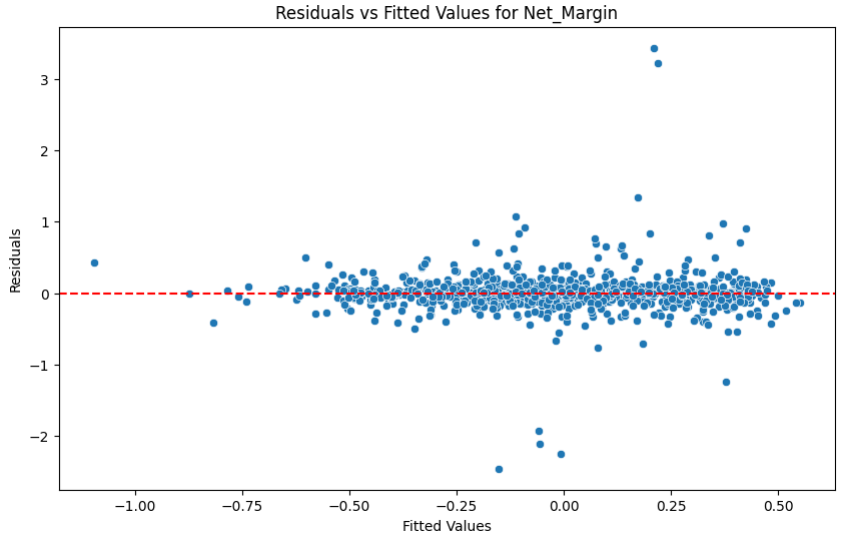

Table 11: Residuals and Fitted Values for Return on Equity:

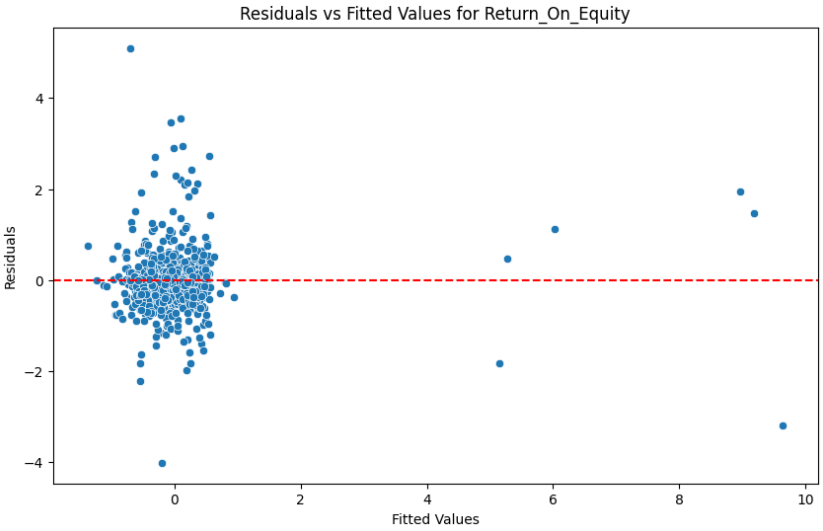

Table 12: Residuals and Fitted Values for Operating Margin (Pillar Scores):

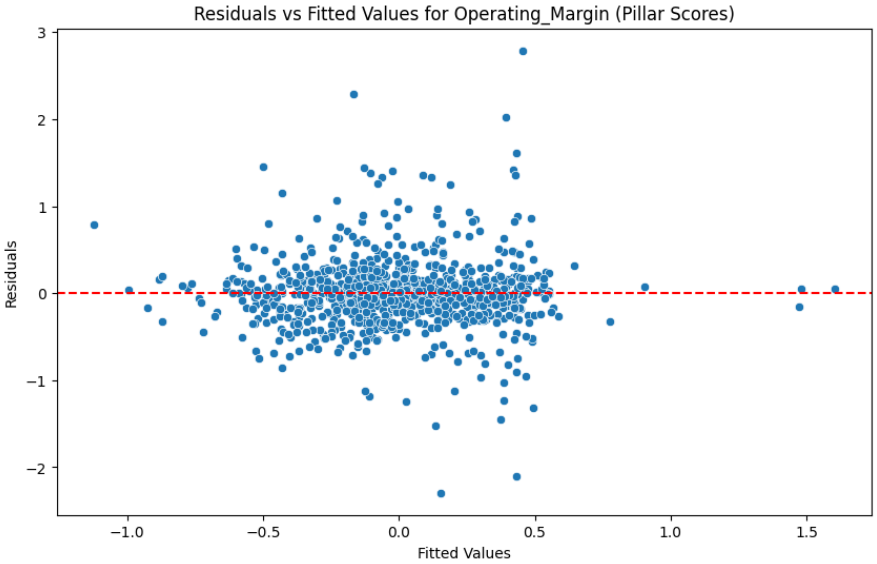

Table 13: Residuals And Fitted Values for Net Margin (Pillar Scores):

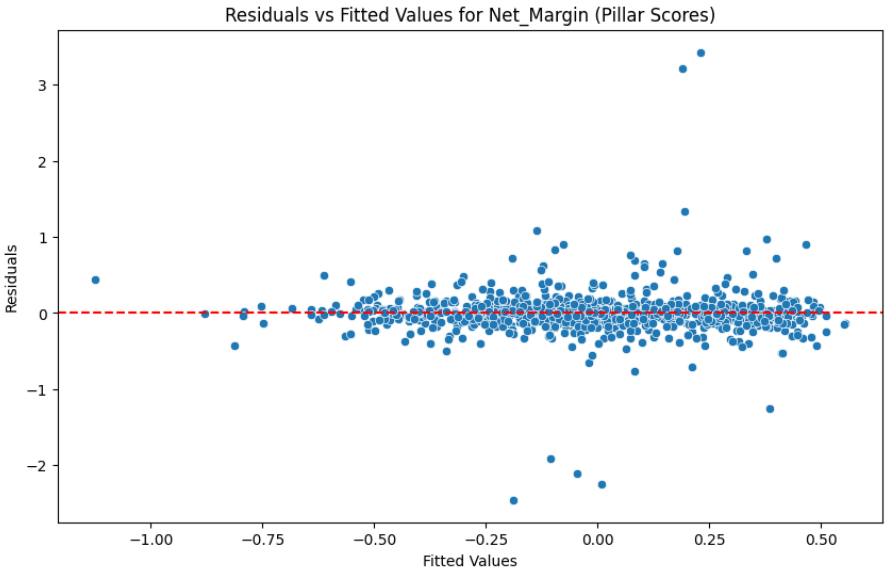

Table 14: Residuals And Fitted Values For Return On Equity (Pillar Scores)