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Research Article

The Impact of ESG Scores on Firm's Financial Performance: Cross Regional Analysis Between Europe and Asia

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Introduction

This study examines the impact of Environmental, Social, and Governance (ESG) score performance across Europe and Asia, offering a unique opportunity to understand how regional and firm contexts shape the relationship between sustainability practices and a firm's financial performance. As the world progresses towards sustainable growth, ESG practices are increasingly being adopted by firms. Companies are no longer evaluated solely on financial metrics, but also on their ability to manage environmental risks, uphold social responsibility and maintain strong governance structures. This global progression reflects growing investor demand, evolving regulatory framework, and increased awareness of long term sustainability.

This study is distinctive in conducting a regional comparative analysis on the impact of ESG on firm financial performance to determine if region context and firm context shape the relationship, and contributes to literature, by first, this study employs a comparative perspective for Europe and Asia. While previous studies such as (Makridou, Doumpos & Lemonakis, 2024; Loew, Endres & Xu, 2024, Koundouri, Pittis & Plataniotis, 2022) examine the relationship of ESG performance in Europe and other studies such as (Lee, Lee, & Yee, 2025; Abdul Rahman & Alsayegh, 2021, Martynova & Lukina, 2023) have examined the same relationship in Asia, these studies individually cannot be compared with each other or to make a comparison between the two regions, as the sample size, variables, and quantitative metrics, differ, making it incomparable. This study uses an equal sample size with the same comparable metrics and variables for both regions. Secondly, previous research has been limited to the top performing firms, which tend to be firms with high capitalization, and high capitalization firms have more profitability and higher ESG scores. Thus, the correlation will already be positive, whereas this study has an equal distribution of firms with similar market capitalization in order to fairly understand the relationship.

Understanding how the regional and firm contexts shape the relationship between ESG scores and a firm's financial performance is important, as it shows whether ESG is a universal driver of value creation or a context dependent mechanism influenced by regional differences. A clearer understanding of these differences contributes to the literature by providing evidence on whether ESG financial performance relationships are consistent across regions, or whether they vary according to regional environments. Freeman (1984) suggests that when the needs of stakeholders are met, this increases firm value as meeting the needs overlap with ESG goals. For instance, the government would want the firm to be more responsible about how it treats the environment and employees would want the firm to be responsible for employee treatment, both pushing for ESG initiatives. This increases firm value, but is it universal or context dependent? Do all firms that engage in ESG initiatives increase their financial performance, or can it hurt their financial performance, even when meeting stakeholder needs? Is it because of regional context or firm context?

This contribution is particularly valuable for policymakers and investors, as it provides insights into how ESG frameworks can be designed and applied effectively in both developed and emerging markets, thereby bridging the gap between the two. This study employs a quantitative method, using Pearson correlations, dynamic regressions, and pooled group and mean group estimators from the panel ARDL framework.

Research Objectives & Aims

- Does the regional context and firm context matter on the impact of ESG scores on a firm's financial performance?

In order to answer this question, the following will also have to be answered:

- Do ESG scores have an impact on a firm's financial performance in Europe and Asia? What is the impact?

This research consists of the literature review where main literature and the theoretical framework are analyzed, the sample criteria & methodology, proceeded with the empirical analysis, the discussion of the findings, and then the conclusion of the results.

2.1: Literature Review

Previous research has examined the relationship between ESG and firm performance. Research by Deb, Behra, and Karkaria (2024) suggest that ESG can positively impact a firm's market performance in short and long observational periods and has a neutral or positive correlation with financial performance; this implies that the sustainability practices in a firm have a positive correlation with market performance, while the correlation between ESG and financial performance is between neutral or positive. Market performance refers to how the firm is performing in the market which is demonstrated in the firm's market share, while financial performance of a firm is demonstrated by its profitability. It is important to understand that in Deb, Behra, and Karkaria (2024)'s dataset was a random sample limited to Indian firms, while it is limited to Indian firms, the positive correlation between ESG and a firm's performance, both financial and the market performance can still be seen on a global scale through Fridge, Busch, and Bassem (2015), in which they conducted a study of 2000 companies based in different regions across developed economies and demonstrated a positive correlation between the two variables, ESG and the Firm's performance. Aydogumus, Gulay, and Ergun (2022) examined the impact of ESG and firm profitability, and concluded that Social and Governance have a positive significant relationship with profitability, while Environment had a weak positive correlation. This implies that the individual relationship between Environment and the firm's financial performance is not significant compared to Social and Governance, this elucidates that Environmental goals do not have a significant impact on the firm's financial performance in their study. Naeem, Cankaya, and Bildik (2022)

argue that the ESG combined score and subcomponents have a positive effect on firm value and profitability. Similarly, D'Amato et al. (2024) uses a machine learning approach to examine the impact of ESG on a firm's performance for 400 companies in Europe; they find a positive correlation between ESG scores and financial performance. Shen (2023) demonstrates a positive correlation between ESG and the firm's overall performance, but argues that the positive correlation is dependent on ESG disclosures to stakeholders. This would imply that in order for the correlation between ESG and the firm's performance to be positive, it is dependent on whether or not the firm discloses their ESG goals. Khan (2022) conducted a bibliometric metaanalysis between ESG and a firm's performance, and showed a positive correlation with firms disclosing ESG practices and the Return on Assets and an increase on Return on Equity (ROE), while there was a weak or non-significant correlation between stock valuations and ESG engagement. It is important to understand that using ROE as a profitability measure for a firm can be inaccurate, this is because ROE is highly sensitive to capital structure. Implying that firms with more leverage would have higher ROE because of lower equity, in other words, firms that take on more debt would have a boost in ROE (Maeenuddin *et al.*, 2020; Waddock & Graves, 1997; Penman, 2013). Furthermore, Khan (2022) used stock valuations as a measure for market performance, Khan (2022)'s metaanalysis implies that ESG has a positive impact on a firm's financial performance, but a non-significant impact on market performance. This correlation can be observed in other studies (e.g. Chen, Liu & Wang, 2023; Aggarwal, Chatterjee & Mukherjee, 2024; De Franco et al., 2020; NYU Stern, 2021). Alareeni and Hamdan (2020) observe a similar correlation, however, the study uses the top firms in the stock exchange, which are firms with a higher market capitalization and, since these firms are already profitable, this creates unintended biases affecting the results of the outcome. These biases happen frequently in research when it is limited to top performing firms and is seen in other studies, such as (e.g. Nguyen, Hoang and Tran, 2022; Shobhwani and Lodha, 2023; Deb, Behra and Dushmantha, 2024), these studies create unintended biases by limiting the study to top performing firms, which tend to have high market capitalization, resources for ESG initiatives, and higher ESG integration.

The contrary shows some research showing a nuanced relationship between ESG and firm performance. For instance, Pellegrini, Caruso, and Mehmeti (2019) suggest that higher ESG scores can increase the expenses and reduce equity costs, they analyzed 182 public companies through multiple regressions and showed an overall negative correlation between ESG and firm financial performance. Interestingly, their analysis showed no linear relationship. Signaling no uniform impact. This implies that the context of the firm can also matter in determining the impact of the ESG on firm performance. If there was a linear slope, it would imply that the ESG score and firm performance are negatively correlated at a constant rate regardless of the context, rather their analysis was 'U' shaped. This elucidates no negative correlation at a constant rate, because the context of the firm matters in determining the relationship. Similarly, Garcia and Orasto (2020) analyze 2,165 firms from 2004 to 2014 and show that there is a negative correlation of ESG and firm performance in emerging countries. This can be because implementing ESG initiatives in a firm can be costly, and these costs can exceed the added benefits it brings (Barnea and Rubin, 2010; Kruger, 2015; Liu et al. 2020).

It is important to understand that literature presents two notable gaps. First, there is a gap in literature as there is no comparative research done on the impact of ESG on firm performance in Europe and Asia, it is important as it allows research to bridge the gap between the emerging world and the developed world, how can the world be expected to be developed without understanding the gaps that differentiate both worlds, without understanding whether ESG is contextual and how its impact can make a difference to firms. Research studies by Demiraj, Dsouza and Demiraj (2023), Sassen, Hinze and Hardeck (2016), and Carnini Pulino et al. (2022) studies ESG's impact on performance in European firms and research by Ali et al., 2022, Ng et al. (2020), Lee, Lee, & Yee (2025), Abdul Rahman & Alsayegh (2021), and Martynova & Lukin (2023), have examined

the ESG's impact on performance in Asian firms. It can be seen that literature does not compare both regions, without a comparison of both regions with equal sample size and variables, it is not possible to compare both nor would it be possible to bridge the gap between emerging countries and the developed ones. For instance, El Khoury and Iskandar (2021) studied the impact of ESG performance in Asia and observed limited correlation, but measured profitability through ROA. Carnini Pulino et al. (2022) studied the impact in Europe and suggested a positive correlation, measuring it by earnings before tax. The differentiation in the measures make it incomparable for a cross region analysis. Sassen, Hinze and Hardeck (2016) argue that there is only a positive relationship between Social score and firm value within Europe, but their analysis is limited to industrial firms. It is important to understand that previous research such as (e.g. Deb, Behra & Dusmanta, 2024; Shobhwani & Lodha, 2023; Nguyen, Hoang & Tran, 2022) has limited the study to the top performing firms in the stock exchange, which are firms with high market capitalization and high profitability. This implies that since the firms do have high capitalization and profitability, they have more resources for ESG initiatives (Janicka & Sajnóg, 2022).

Secondly, previous research has used various methodological regressions to examine the impact between the two variables; ESG score and firm financial performance, but including a Pooled Mean Group (PMG) and Mean Group (MG) estimator was limited. The pool mean group is an estimator allowing short run coefficients, intercepts and error variances to vary across sectional units. It estimates dynamic regressions for all units, while the Mean Group estimates the dynamic regression for each firm separately and then averaging it (Pesaran, Shin, and Smith 1999). This method is useful to depict how ESG shocks play out over time and to observe how quickly firms would return to their performance path (i.e. the equilibrium in the model). Although research often neglects this as previous research focuses more on the ESG impact, PMG and MG can be used as a mechanism to determine whether such ESG impacts are a uniform pattern, or does it depend on the firm and regional contexts. In Pellegrini, Caruso, and Mehmeti (2019) research in which they analyzed 182 companies through multiple regressions, implementing this estimator would be able to clearly determine whether the relationship was uniform or was it dependent based on firm context. For instance, a significant MG variable and an insignificant PMG variable, would imply the firm context does matter and that the firms do not share a long run performance relationship (Pesaran, Shin, and Smith 1999).

This study uses the stakeholder theory as a theoretical framework in order to understand the results of this study. The theoretical framework is important as it is grounded in the study and is used to identify the causes of the outcome of the study:

2.2 Theoretical Framework: Stakeholder Theory

The stakeholder theory proposed by Freeman (1984) demonstrates the relation between the firm's profitability and its ESG goals (Hörisch et al., 2014). Freeman (1984)'s theory argues that a firm's long term success is dependent on its relationship with key stakeholders. Stakeholders are any group or individual who can affect or is affected by the firm. This framework challenges the traditional shareholder-view by emphasizing on the importance of mutual value creation between a firm and its stakeholders. This theory gives importance to all the groups affected by the firm activities both, directly or indirectly (Wicks et al., 2004). First, it is important to understand the relationship Freeman (1984) theorizes between stakeholders and ESG, is that when firms satisfy the needs of stakeholders, this benefits the firm in terms of sustainability. This would imply that if a firm were to introduce social policies and benefits for employees or customers, this would not only satisfy this group of stakeholders, but also increase the Social, or ESG score of a firm, by already satisfying the needs of its stakeholders. It is also important to understand that since both internal and external stakeholders are interested in the firm's affairs, stakeholders frequently would pressure firms to improve positive and to

mitigate the negative values (Sarkis et al., 2010). While studies show that when firms have enhanced relationships with stakeholders which can lead to a higher financial performance (Dmytriiev, Freeman, and Horisch, 2021; Scholtens & Zhou, 2008; Avinash P. Singh, 2022; Berman, Wicks, Kotha & Jones, 2017), enhanced stakeholder relationship contributes to the ESG goals of the firm. This implies that when a firm has enhanced stakeholder relations, this is a contributory factor to the increased financial performance of the firm (Ho, Nguyen and Dang, 2024). Bose and Philips (2019) conducted a quantitative analysis between stakeholder engagement and profitability, it shows a positive correlation between stakeholder engagement and profit.

3. Sample Size & Criteria

The dataset consists of 700 firms from Europe and 700 firms from Asia, covering the years 2014–2024. The sample is balanced across firm sizes and market capitalization to reduce bias. Although the original aim was 1,300 firms per region, data availability restricted the sample to 700, which remains a large scale and regionally comparative dataset relative to prior studies, many of which focused only on the top 100 or firms with high market capitalization. This study sets the criteria that firms must be listed on the stock exchange, and cannot be listed in multiple exchanges. This research utilizes data from the LSEG database for the appropriate data for each country. LSEG is a professional provider for financial data globally, and provides balance sheet items, financial measures on annual reports, and ESG scores. The correlation heatmaps from the data are constructed using Stata and panel regression models are constructed through python due to data constraints on Stata.

3.1: Differences from Previous Research Models

Previous research on ESG and financial performance has largely relied on static panel models such as OLS, or the use of fixed effects, or random effect regressions separately (e.g., El Ghouli et al., 2011; Waddock & Graves, 1997). While other researches have solely relied on linear models, but researches (e.g., Yu et al., 2024; Li et al., 2024; Tarawneh et al., 2024; Cheng et al., 2025) demonstrate that the relationship is not always linear between the variables. While these approaches provide insights, they are limited in their ability to capture long run dynamics and firm heterogeneity. Studies by (e.g., Naeem et al., 2022; Rahat & Nguyen, 2024) have shown the importance of utilizing dynamic estimation models and the importance of analyzing regional contexts.

This study builds on insights by combining traditional panel regressions (FE and RE), influenced by research (Quintiliani, 2022 & Aydogmus et al. 2022). However, this study also takes into account control variables in the regressions, and isolates each component with fixed and also includes panel ARDL estimators: Pooled Mean Group and Mean Group. These models are particularly suited for ESG analysis, as they allow the research to (i) distinguish between short- and long-run effects, (ii) account for heterogeneous firm adjustments, and (iii) test whether ESG effects are universal or contextual across firms and regions. This methodological component is distinctive in this study and ensures a robust analysis

3.2 Dependent Variables

There are two primary dependent variables of this study, it is Tobin's Q, determining market based performance and Return on Assets (ROA), an accounting measure for profitability.

Tobin's Q is a measure of the ratio of the market value of a company to the book value of its assets (MV / Cost of Assets), where MV is the market value divided by the cost of assets. This is an appropriate proxy of a firm's value as this determines whether the stock of a firm is being traded at the appropriate price in the market as it is a comparison of the firm's market value. Wernerfelt and Montgomery (1988) emphasize the importance

of using Tobin's Q for the valuation of a firm's performance, as this gives an appropriate measure of how the market values a firm relative to the replacement cost of assets. Numerous studies have used Tobin's Q as an indicator of a firm's value (e.g. Naeem et al. (2022); Rahat and Nguyen (2024); Bahadir and Akarsu (2024); Veeravel, Murugesan, and Narayanamurthy (2024).

The second primary dependent variable is the ROA, which is a ratio of net income to total assets. ROA is a measure that can evaluate the profitability of the firm and elucidates how the firm's resources are being effectively used to generate returns. This has been used by previous research (e.g. Saygili et al. (2022); Aydoğmuş et al. (2022); Naeem et al. (2022); Shaikh (2022); Bahadir and Akarsu (2024) and Veeravel et al. (2024).

3.3 Independent Variables

This study includes four independent variables, it is the individual ESG score for each component: Environment, Social and Governance and the total ESG score. These variables are sourced from the LSEG database and annual corporate reports.

3.4 Control Variables

This research uses firm leverage and firm size as the control variables for this study. It is important to utilize these as control variables in order to prevent biases or misleading results from this study. Without controlling for them, results can be misleading as these factors can play a role in the influence of a firm's performance (Quintiliani, 2022; Aydogmus et al. 2022; Yang and Lan, 2024; Naeem et al, 2022). It is important to note that the proxy for firm size are total assets, which is calculated by the log return of total assets. To control for financial leverage, this study uses total debt / total assets. This serves as a proxy for the traditional debt-to-equity ratio, widely used in the literature (e.g., El Ghouli et al., 2011; Waddock & Graves, 1997).

3.5 Study Variables

The figure below illustrates all the variables used in this study:

Variables	Source Method	
ROA (Profitability)	Net Income / Total Assets	Dependent
Tobin's Q (Firm Value)	(Market Value of Equity + Total Liabilities) / Total Assets	Dependent
ESGCS (ESG Combined Score)	LSEG Database	Independent
ENV (Environmental Score)	LSEG Database	Independent
SOC (Social Score)	LSEG Database	Independent
GOV (Governance Score)	LSEG Database	Independent

Control Variables	Source Method	
LEV (Leverage)	Total Debt / Total Assets	Control
SIZE (Firm Size)	ln(Total Assets)	Control

3.6: Empirical Model

This research uses the following panel data regression models to examine the relationship between ESG and firm performance, similar to (Jucá *et al.*, 2024 & Aydogmus *et al.* 2022), but accounts for control variables. The first equation evaluates the effect of the total ESG s core effect on firm performance, while the second equation examines the impact of each ESG component individually.

$$FPerformance_{i,t} = \alpha + \gamma_i + \delta_t + \beta_1 ESGCS_{i,t} + \beta_2 LEV_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 RET_{i,t} + \varepsilon_{i,t}$$

$$FPerformance_{i,t} = \alpha + \gamma_i + \delta_t + \beta_1 ENV_{i,t} + \beta_2 SOC_{i,t} + \beta_3 GOV_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 RET_{i,t} + \varepsilon_{i,t}$$

Equation Model: FPerformance = Firm performance (measured by Tobin's Q or ROA). ESGS = Total ESG score. ENV = Environmental score. SOC = Social score. GOV = Governance score. LEV = Leverage (debt ratio). SIZE = Firm size (log of total assets). γ_i = Firm fixed effects (controls for firm specific characteristics). δ_t = Time fixed effects (controls for year specific shocks). ε_{it} = Error term (random disturbance).

4.1: Descriptive Statistics

4.1 Descriptive Statistics- European Firms

Table 5.1: Descriptive Statistics. This table shows the summary statistics for the data in this analysis for the European sample.

	Mean	Std. Dev.	Min	Max
ROA	0.06	0.1	-0.193	1.398
Tobin's Q	1.801	2.862	0.31	53.163
Firm Size	22.837	2.3	17.991	27.935
Leverage	0.868	1.697	0.0	35.162
Stock Return	0.141	0.862	-0.745	20.0
ESG Score	63.579	15.917	3.444	94.81
Environment	60.636	21.989	0.0	97.449
Social	65.332	19.193	2.351	97.232
Governance	63.237	19.136	4.879	96.561
Total Assets	76939154433.419	192754410613.657	65050408.966	1355509051135.41

4.1.2 Descriptive Statistics- Asian Firms

Table 5.1.2: Descriptive Statistics. This table shows the summary statistics for the data in this analysis for the Asian sample.

	Mean	Std. Dev.	Min	Max
ROA	0.041	0.067	-0.267	0.321
Tobin_Q	1.222	0.788	0.39	7.876
Firm_Size	22.998	1.762	19.579	29.307
Leverage	0.523	0.225	0.021	1.339
Stock_Returns	-0.082	0.321	-0.853	2.663
ESG_Score	58.085	13.439	19.584	88.785
Environmental_Score	62.702	18.033	0.0	98.27
Social_Score	57.203	17.894	16.082	95.072
Governance_Score	54.638	20.164	4.658	91.58
Total_Assets	94386408058.18	476536913596.967	318301009.937	5346159436904.91

4.2: Correlation Analysis (European Firms)

5.2.1 Pearson Correlation Matrix- European Firms

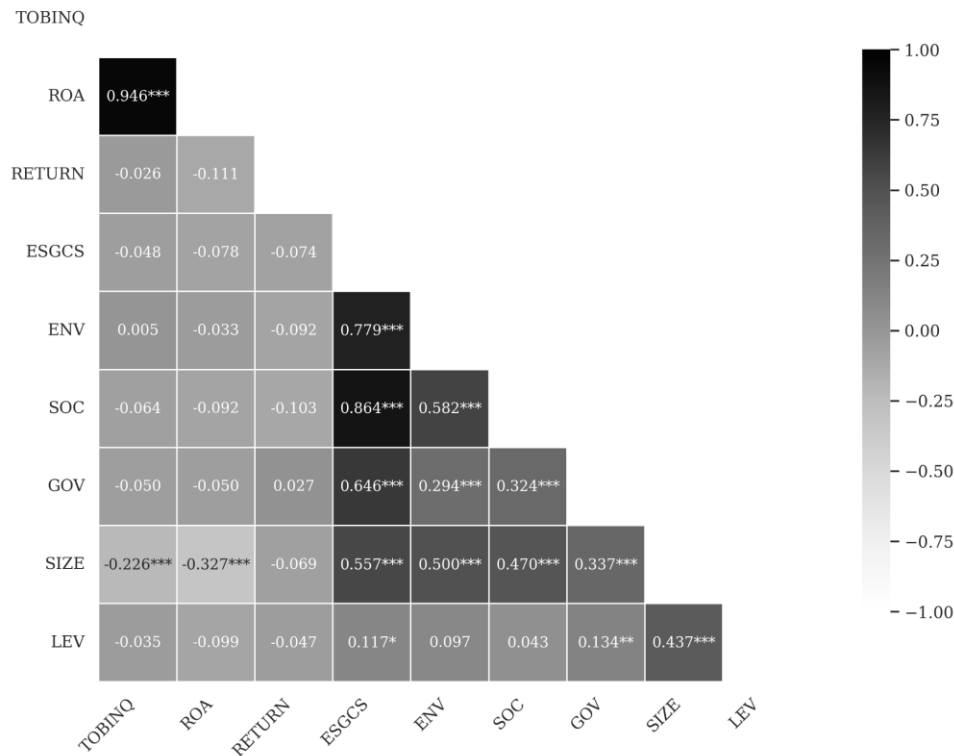


Table 5.2.1: Pearson Correlation Matrix. Tobin Q is measured as the market value of the company divided by its asset replacement costs. 'ROA' is the Return on Assets. Return indicates the stock return based on the stock prices, 'ESGCS' indicates the total ESG score, 'Env' is the Environmental Score, 'Soc' is the Social score, Gov is the Governmental Score, Size indicates the Firm Size and 'Lev' indicates the leverage based on the debt/equity ratio formula. '***' indicates $p < 0.01$ (e.g highly significant), '**' indicates $p < 0.05$ (e.g significant at 95% confidence), '*' indicates $p < 0.10$ (e.g marginally significant at 90% confidence), 'no star' indicates $p \geq 0.10$ (e.g no statistical significance).

Table 5.2.1 presents the Pearson correlation coefficients between the study's key variables, including ESG performance (ESGCS and its sub-pillars), firm financial performance (ROA and Tobin's Q), stock returns, firm size, and leverage. The analysis reveals several notable patterns that align with theoretical expectations and prior empirical literature.

There is a strong positive correlation between Tobin's Q and ROA ($r=0.946***$), this observation is evident that firms with higher profitability tend to also exhibit higher market valuations. Tobin's Q shows a statistically significant positive correlation with ESGCS ($r = 0.141**$) and firm size ($r = 0.196***$), this relationship implies that the firms which are perceived as more sustainable are highly valued in the perception of investors. Leverage demonstrates a weak, but significant negative correlation with Tobin's Q ($r = -0.119**$), this aligns with the trade-off theory, as debt and costs devalue market valuation of the firm due to the potential financial risk.

It is interesting to note that the total ESG score (ESGCS) does not have a significant relationship with ROA ($r = -0.061$) or with stock returns ($r = -0.082$), this elucidates that ESG activities are not correlated with investor

returns in the short term investor returns. This aligns with mixed findings in the ESG literature, where researchers argue that ESG benefits are more long-term, rather than short-term. It is important to understand that ESGCS is strongly correlated with its sub-pillars: environmental ($r = 0.778^{***}$), social ($r = 0.845^{***}$), and governance ($r = 0.626^{***}$), this validates the use of ESGCS as a comprehensive ESG measure

The firm size is observed to have a positive correlation with ESGCS ($r = 0.557^{***}$), this implies that larger firms have more resources to allocate toward sustainability initiatives. There is a weak negative correlation between Leverage and ROA ($r = -0.103^*$), consistent with literature findings that suggest debt burdens can constrain operational profitability. It affirms the relevance of size and leverage as control variables in the regression models.

4.3: Regression Tests Europe

4.3.1: Panel Regression (ROA Dependent)

Variable	Model 1 FE	Model 1 RE	Model 2 FE	Model 2 RE	Model 3 FE	Model 3 RE	Model 4 FE	Model 4 RE
Constant	0.4213*** [0.0446]	0.4280*** [0.0180]	0.4302*** [0.0484]	0.4441*** [0.0185]	0.4636*** [0.0612]	0.4204*** [0.0179]	0.4364*** [0.0499]	0.4153*** [0.0178]
ESGCS	0.0008*** [0.0003]	0.0006*** [0.0001]						
ENV			0.0006* [0.0003]	0.0005*** [0.0001]				
SOC					0.0002 [0.0003]	0.0003*** [0.0001]		
GOV							0.0005* [0.0003]	0.0002** [0.0002]
SIZE	-0.0178*** [0.0025]	-0.0177*** [0.0025]	-0.0178*** [0.0025]	-0.0182*** [0.0025]	-0.0178*** [0.0025]	-0.0165*** [0.0025]	-0.0178*** [0.0025]	-0.0161*** [0.0028]
LEV	-0.0019*** [0.0004]	-0.0025*** [0.0006]	-0.0019*** [0.0004]	-0.0024*** [0.0006]	-0.0019*** [0.0004]	-0.0025*** [0.0006]	-0.0019*** [0.0004]	-0.0026*** [0.0006]

Table 4.3.1: Panel Regression Analysis, dependent variable is ROA. This model uses Fixed Effects (FE) and (RE) random effects estimations. ‘Constant’ is the intercept when all values are equal indicating a baseline level of the dependent variable ‘ROA’ with the assumption of all independent variables equal to zero. ‘ESGCS’ is the total ESG score. ‘ENV’ refers to the environment score, ‘SOC’ Social score, ‘GOV’ Governance score, ‘SIZE’ is the firm size equal to the log of the total assets and ‘LEV’ is the leverage of the firm calculated by the D/E Ratio. Numbers in the parentheses illustrate the standard error. ‘*** indicates $p < 0.01$ ’ (e.g highly significant), ‘** indicates $p < 0.05$ ’ (e.g significant at 95% confidence), ‘* indicates $p < 0.10$ ’ (e.g marginally significant at 90% confidence), ‘no star’ indicates $p \geq 0.10$ (e.g no statistical significance).

The panel regression analysis demonstrates the relationship between ESG performance and the firm’s profitability, measured by using ROA as the dependent variable. It was performed by using both Fixed Effects (FE) and Random Effects (RE) in four sets of models. The first model utilizes the composite esg score, and models 2-4 were performed isolating each of the ESG sub pillars in order to avoid multicollinearity in the regression as the ESG scores are highly correlated with each other.

Model 1 examines the effect of the composite ESG score on ROA, it demonstrates a positive and highly significant relationship between ESG and ROA. This implies that the ESG has an impact on the ROA. Both, FE and RE estimations show statistically significant coefficients at the 1% level (0.0008 and 0.0006). This

implies that firms with a higher ESG performance tends to have a higher return on assets, further implying that such firms tend to have higher profitability.

In model 2, the Environmental (ENV) aspect is isolated, which shows a positive and statistically significant effect on ROA. The FE model coefficient is significant at the 10% level, while the RE model result is highly significant at the 1% level. This implies that firms engaged in environmental practices, tend to perform better in terms of profitability.

Model 3 focuses on the social score (SOC). There is no statistically significant effect while using fixed effects (FE), while the random effects (RE) shows a small, yet significant positive impact on ROA. This implies that social factors of the firm can contribute to the ROA, but the effect is likely indirect. It is important to understand that the inconsistency observed between two models, one having no statistically significant impact and the latter having a statistically significant impact demonstrates that social investments or activities can take a longer time period to reflect on the profitability of the firm.

Model 4 focuses on the governance (GOV) aspect. There is a positive relationship observed between GOV and the ROA, while using both models; the FE (10% level) and RE (5% level). This implies that firms with a higher governance score tend to have a higher profitability.

The control variables, firm size and leverage show consistent negative and highly significant coefficients. The negative coefficient for SIZE suggests that larger firms, potentially due to bureaucracy or inefficiencies, may exhibit lower profitability. Similarly, the negative effect of LEV indicates that highly leveraged firms face increased interest burdens and financial risk, which adversely affects ROA.

The overall results show that the environmental and governance score has a higher positive and statistical impact on the firm's profitability, while the social score also does have an impact but it is not highly significant impact compared to environmental and governance. This shows that ESG has a positive impact on increasing firm profitability.

4.3.2: Panel Regression (Tobin's Q Dependent)

Variable	Model 1 FE	Model 1 RE	Model 2 FE	Model 2 RE	Model 3 FE	Model 3 RE	Model 4 FE	Model 4 RE
Constant	1.2854*** [0.0000]	5.2963*** [0.4630]	1.2046*** [0.0000]	5.1248*** [0.4514]	0.7828*** [0.0000]	5.3809*** [0.4577]	1.8401*** [0.0000]	4.9144*** [0.4695]
ESGCS	0.0000*** [0.0000]	0.0091*** [0.0023]						
ENV			0.0012*** [0.0000]	0.0101*** [0.0018]				
SOC					0.0085*** [0.0000]	0.0109*** [0.0020]		
GOV							-0.0077*** [0.0000]	-0.0002 [0.0019]
SIZE	0.0000* [0.0000]	-0.1915*** [0.0231]	0.0000 [0.0000]	-0.1867*** [0.0213]	0.0000 [0.0000]	-0.2018*** [0.0224]	-0.0000 [0.0000]	-0.1474*** [0.0228]
LEV	-0.0000*** [0.0000]	-0.0082 [0.0119]	-0.0000 [0.0000]	-0.0049 [0.0119]	-0.0000*** [0.0000]	-0.0057 [0.0118]	0.0000*** [0.0000]	-0.0127 [0.0120]

Table 4.3.2 Tobin Q: Panel Regression Analysis, dependent variable is Tobin's Q. This model uses Fixed Effects (FE) and (RE) random effects estimations. 'Constant' is the intercept when all values are equal indicating a baseline level of the dependent variable 'Tobin's Q' with the assumption of all independent variables equal to zero. 'ESGCS' is the total ESG score. 'ENV' refers to the environment score, 'SOC' Social score, 'GOV' Governance score, 'SIZE' is the firm size equal to the log of the total assets and 'LEV' is the

leverage of the firm calculated by the D/E Ratio. Numbers in the parentheses illustrate the standard error. ‘*** indicates $p < 0.01$ ’ (e.g highly significant), ‘** indicates $p < 0.05$ ’ (e.g significant at 95% confidence), ‘* indicates $p < 0.10$ ’ (e.g marginally significant at 90% confidence), ‘no star’ indicates $p \geq 0.10$ (e.g no statistical significance).

Model 1 investigates the relationship between the total ESG score on Tobin’s Q. There is a positive and highly significant relationship between the total ESG score and Tobin’s Q, observed in both the fixed effects and random effects model. The coefficient is slightly higher in the RE model, suggesting that cross-sectional variation contributes meaningfully to explaining firm value. This implies that firms with higher ESG performance have higher market valuations.

Model 2 focuses on the relationship of the environmental score on Tobin’s Q. There is a positive and statistically significant impact of ENV on Tobin’s Q, with stronger coefficients in the RE model. This suggests that firms engaged in environmental practices are perceived as more valuable in the market.

Model 3 focuses on the relationship of the social score on Tobin’s Q. It shows a positive strong relationship, with coefficients statistically significant in both FE and RE models. This implies that firms with a higher social score are perceived with a higher market valuation. It is interesting to note that the coefficients on firm size and leverage maintain their signs and significance, reinforcing the robustness of these control variables across models.

Model 4 focuses on the governmental score on Tobin’s Q. Inconsistency can be observed in the results, the fixed effects model shows a negative and significant relationship between governance score and Tobin’s Q, whereas the random effects model yields an insignificant and near zero coefficient. Implying that governance does not have a positive impact on the firm’s market valuation and performance. The control variables; firm size is again negatively and significantly related to Tobin’s Q in the RE model, and leverage remains negative.

4.3.3: Pooled Mean Group & Mean Group Estimators (Panel ARDL) - European Firms

Dependent Variable: ROA

Spec (x)	Long-run (PMG) β	SE (PMG)	p-value (PMG)	Long-run (MG) β	SE (MG)	p-value (MG)
Total ESG	0.00000749	0.0001839	0.968	0.00775 **	0.00393	0.047
Environmental	0.00006719	0.0001634	0.675	0.01903 **	0.01162	0.018
Social	0.00009109 **	0.0001152	0.038	0.00114 *	0.00357	0.075
Governance	0.00006790	0.0001337	0.602	0.00613 **	0.00612	0.016

Table 5.3.3: This table reports the long-run coefficients (β), standard errors (SE), and p-values from the Pooled Mean Group (PMG) and Mean Group (MG) estimators. The independent variables are Total ESG, Environmental, Social, and Governance scores. . ‘*** indicates $p < 0.01$ ’ (e.g highly significant), ‘** indicates $p < 0.05$ ’ (e.g significant at 95% confidence), ‘* indicates $p < 0.10$ ’ (e.g marginally significant at 90% confidence), ‘no star’ indicates $p \geq 0.10$ (e.g no statistical significance).

The estimations provide valuable insights into the long-run relationship between ESG and firm profitability, measured through ROA. The PMG estimator shows insignificant results, with only the social pillar showing

significance ($\beta = 0.00009109$, $p = 0.038$). This suggests that social initiatives contribute positively to profitability across European firms.

The MG estimator, which allows for firm-level heterogeneity, shows that Total ESG performance has a positive and statistically significant effect on ROA ($\beta = 0.00775$, $p = 0.047$). This implies that, on average, firms with stronger ESG practices tend to generate higher profitability. Additionally, both Environmental ($\beta = 0.01903$, $p = 0.018$) and Governance ($\beta = 0.00613$, $p = 0.016$) emerge as significant drivers of profitability, while Social performance shows a positive but only marginally significant effect ($p = 0.075$). The statistically significant results in MG suggest that the ESG profitability link is not universal but context dependent. This indicates that firm factors have an effect in determining whether ESG practices lead to increase profitability within European firms. The overall positive relationship agrees with previous findings.

4.3.4: Pooled Mean Group & Mean Group Estimators (Panel ARDL) - European Firms

Dependent Variable: Tobin's Q

Spec (x)	Long-run (PMG) β	SE (PMG)	p-value (PMG)	Long-run (MG) β	SE (MG)	p-value (MG)
Total ESG	0.0159**	0.0103	0.0126	0.0425	0.0534	0.427
Environmental	0.0029	0.0048	0.547	-0.2233**	0.2542	0.0380
Social	0.0092**	0.0085	0.0278	0.1318*	0.0757	0.0820
Governance	0.0119**	0.0053	0.0250	0.0547*	0.0488	0.023

Table 5.3.4: This table reports the long-run coefficients (β), standard errors (SE), and p-values from the Pooled Mean Group (PMG) and Mean Group (MG) estimators. The independent variables are Total ESG, Environmental, Social, and Governance scores. '*** indicates $p < 0.01$ ' (e.g highly significant), '** indicates $p < 0.05$ ' (e.g significant at 95% confidence), '* indicates $p < 0.10$ ' (e.g marginally significant at 90% confidence), 'no star' indicates $p \geq 0.10$ (e.g no statistical significance).

The results show the relationship between market valuation and ESG. The Pooled Mean Group (PMG) estimator, Total ESG ($\beta = 0.0159$, $p = 0.013$), Social ($\beta = 0.0092$, $p = 0.028$), and Governance ($\beta = 0.0119$, $p = 0.025$) all show positive and statistically significant long-run effects on Tobin's Q. This implies that European firms with higher ESG engagement are valued more highly by investors, particularly when improvements are made in social and governance practices. Interestingly, the Environmental performance is statistically insignificant ($\beta = 0.0029$, $p = 0.547$) under the PMG. The Mean Group (MG) estimator, which allows for firm specific heterogeneity, shows that the Environmental performance exhibits a significant negative effect on Tobin's Q ($\beta = -0.2233$, $p = 0.038$). This suggests that for some firms, environmental initiatives can be costly. It is important to understand this relationship would exist within certain firms, indicating that in some firms it has a negative relationship. It is not a uniform effect across all firms, rather context dependent.

4.5: Correlation Analysis (Asian Firms)

4.6: Regression Tests- Asia

4.6.1: Panel Regression Analysis- Asian Firms

Dependent Variable: ROA

Variable	Model 1 FE	Model 1 RE	Model 2 FE	Model 2 RE	Model 3 FE	Model 3 RE	Model 4 FE	Model 4 RE
Constant	-0.1450 [0.1558]	-0.0578 [0.0672]	-0.1893 [0.1516]	-0.0683 [0.0655]	-0.0872 [0.1503]	-0.0522 [0.0669]	-0.0702 [0.1400]	-0.0524 [0.0673]
ESGCS	-0.0003* [0.0002]	-0.0002 [0.0001]						
ENV			-0.0003** [0.0001]	-0.0002** [0.0001]				
SOC					-0.0001 [0.0001]	-0.0000 [0.0001]		
GOV							0.0000 [0.0001]	0.0001 [0.0001]
SIZE	0.0089 [0.0072]	0.0044 [0.0030]	0.0109 [0.0069]	0.0050 [0.0029]	0.0058 [0.0069]	0.0038 [0.0030]	0.0049 [0.0064]	0.0036 [0.0031]
LEV	0.0020 [0.0149]	0.0092 [0.0148]	0.0016 [0.0148]	0.0083 [0.0147]	0.0025 [0.0151]	0.0102 [0.0149]	0.0026 [0.0151]	0.0107 [0.0149]

Table 4.6.1 ROA: Panel Regression Analysis, dependent variable is ROA. This model uses Fixed Effects (FE) and (RE) random effects estimations. ‘Constant’ is the intercept when all values are equal indicating a baseline level of the dependent variable ‘Tobin’s Q’ with the assumption of all independent variables equal to zero. ‘ESGCS’ is the total ESG score. ‘ENV’ refers to the environment score, ‘SOC’ Social score, ‘GOV’ Governance score, ‘SIZE’ is the firm size equal to the log of the total assets and ‘LEV’ is the leverage of the firm calculated by the D/E Ratio. Numbers in the parentheses illustrate the standard error. ‘***’ indicates $p < 0.01$ (e.g highly significant), ‘**’ indicates $p < 0.05$ (e.g significant at 95% confidence), ‘*’ indicates $p < 0.10$ (e.g marginally significant at 90% confidence), ‘no star’ indicates $p \geq 0.10$ (e.g no statistical significance).

Model 1 examines the relationship between the total ESG score (ESGCS) and the ROA with fixed effects and random effects. The fixed effects model shows that ESGCS has a negative and statistically significant effect on ROA (coefficient = -0.0003, standard error = 0.0002, $p < 0.1$). This implies that higher ESG performance marginally decreases profitability in Asian firms. The RE model also reports a negative coefficient (-0.0002), but it is not statistically significant. The control variable for firm size is positive (0.0089 in the FE model and 0.0044 in the RE model) but not statistically significant, while leverage also shows no significant influence on ROA (0.0020 in FE, 0.0092 in RE).

Model 2 isolates the environmental score (ENV) with the ROA. Both the fixed and random effects models report a significant negative relationship between ENV and ROA (FE coefficient = -0.0003, RE = -0.0002; both $p < 0.05$). This implies that environmental actions by the firm can reduce short term profitability due to the costs associated with it, this observation is also seen from literature. Firm size continues to show a positive but non-significant impact (0.0109 in FE; 0.0050 in RE), while leverage remains insignificant (0.0016 in FE; 0.0083 in RE).

Model 3 isolates the social score (SOC) with the ROA. The relationship is negative in both models but insignificant (FE coefficient = -0.0001, RE = -0.0000). This suggests that the social dimension of ESG has no meaningful effect on profitability among Asian firms. A similar relationship can be seen in Model 4, in which it isolates the governmental score (GOV) with the ROA. While both coefficients are positive (0.0000 in FE;

0.0001 RE with standard error of 0.0001 in both), this implies that the firm governance policies do not have a significant influence on profitability. The control variables, Firm size (0.0049 in FE; 0.0036 in RE) and leverage (0.0026 in FE; 0.0107 in RE) continue to show no significant impact.

4.6.2: Panel Regression Analysis- Asian Firms

Dependent Variable: Tobin's Q

Variable	Model 1 FE	Model 1 RE	Model 2 FE	Model 2 RE	Model 3 FE	Model 3 RE	Model 4 FE	Model 4 RE
Constant	18.521*** [3.0572]	13.046*** [2.2151]	18.893*** [3.2244]	13.139*** [2.2755]	18.519*** [3.0704]	13.113*** [2.2098]	18.070*** [2.5502]	13.258*** [2.0655]
ESGCS	0.0013 [0.0023]	-.0020 [0.0021]						
ENV			0.0017 [0.0018]	-.0007 [0.0015]				
SOC					0.0011 [0.0020]	-.0011 [0.0017]		
GOV							-0.0013 [0.0016]	-0.0023 [0.0015]
SIZE	-0.7797*** [0.1438]	-0.5239*** [0.1018]	-0.7975*** [0.1508]	-0.5313*** [0.1040]	-0.7790*** [0.1433]	-0.5293*** [0.1007]	-0.7530*** [0.1170]	-0.5323*** [0.0916]
LEV	0.7307 [0.4334]	0.6423 [0.3885]	0.7367 [0.4336]	0.6491 [0.3896]	0.7248 [0.4314]	0.6512 [0.3864]	0.7080 [0.4338]	0.6363 [0.3880]

Table 5.4.3 Tobin's Q: Panel Regression Analysis, dependent variable is Tobin's Q. This model uses Fixed Effects (FE) and (RE) random effects estimations. 'Constant' is the intercept when all values are equal indicating a baseline level of the dependent variable 'Tobin's Q' with the assumption of all independent variables equal to zero. 'ESGCS' is the total ESG score. 'ENV' refers to the environment score, 'SOC' Social score, 'GOV' Governance score, 'SIZE' is the firm size equal to the log of the total assets and 'LEV' is the leverage of the firm calculated by the D/E Ratio. Numbers in the parentheses illustrate the standard error. '*** indicates $p < 0.01$ ' (e.g highly significant), '** indicates $p < 0.05$ ' (e.g significant at 95% confidence), '* indicates $p < 0.10$ ' (e.g marginally significant at 90% confidence), 'no star' indicates $p \geq 0.10$ (e.g no statistical significance).

Model 1 examines the relationship between the total ESG score (ESGCS) with firm performance through Tobin's Q. The FE model shows a positive but statistically insignificant relationship (coefficient = 0.0013, standard error = 0.0023), suggesting that ESG performance does not significantly influence market-based firm value in Asian markets. It is interesting to note that the random effects model shows a negative and insignificant coefficient (-0.0020, standard error = 0.0021). The FE and RE models have an inconsistency in the direction (e.g positive or negative). Firm size (SIZE) shows a significant negative relationship with Tobin's Q across both models (FE = -0.7797, RE = -0.5239; $p < 0.01$), suggesting that larger firms tend to have lower market valuation ratios. Leverage (LEV) is positive but statistically insignificant in both models (FE = 0.7307, RE = 0.6423).

In Model 2, which focuses on the environmental score (ENV) shows a positive but insignificant coefficient in the fixed effects (0.0017, standard error = 0.0018), while the random effects model reports a small negative and non-significant value (-0.0007, standard error = 0.0015). This implies there is no meaningful correlation between the firm's environmental score and its market performance. Firm size remains highly significant and negative (FE = -0.7975, RE = -0.5313; both $p < 0.01$), while leverage maintains its positive but insignificant effect (FE = 0.7367, RE = 0.6491).

While examining the relationship with the social score (SOC) in Model 3, it can be seen that it exhibits a similar relationship with Model 1 and Model 2. The fixed effects model shows a positive, but insignificant

relationship (coefficient = 0.0011, standard error = 0.0020), while the random effects model reports a negative (coefficient = -0.0011, standard error = 0.0017), which is also insignificant statistically. The negative and highly significant coefficient on firm size remains consistent (FE = -0.7790, RE = -0.5293; $p < 0.01$), while leverage continues to be positive but not significant (FE = 0.7248, RE = 0.6512).

Model 4 shows a negative correlation in both, the fixed effect and the random effect models (FE = -0.0013, RE = -0.0023). This implies that a higher governance score can lead to a lower market valuation, but this is statistically insignificant.

4.6.3: Pooled Mean Group & Mean Group Estimators (Panel ARDL) - Asian Firms

Dependent Variable: ROA

Spec (x)	Long-run (PMG) β	SE (PMG)	p-value (PMG)	Long-run (MG) β	SE (MG)	p-value (MG)
Total ESG	-0.00092 **	0.00212	0.0066	-0.00293 **	0.00383	0.0450
Environmental	-0.00174 **	0.00168	0.0310	-0.00377 **	0.00320	0.0242
Social	-0.00120 *	0.00194	0.0537	-0.00218 *	0.00365	0.0554
Governance	-0.00113 **	0.00112	0.0316	-0.00058 *	0.00202	0.0770

Table 4.6.3: This table reports the long-run coefficients (β), standard errors (SE), and p-values from the Pooled Mean Group (PMG) and Mean Group (MG) estimators. The independent variables are Total ESG, Environmental, Social, and Governance scores. ‘*** indicates $p < 0.01$ ’ (e.g highly significant), ‘** indicates $p < 0.05$ ’ (e.g significant at 95% confidence), ‘* indicates $p < 0.10$ ’ (e.g marginally significant at 90% confidence), ‘no star’ indicates $p \geq 0.10$ (e.g no statistical significance).

The PMG results show consistently negative long-run coefficients across all ESG dimensions, although the economic effects are small. Total ESG has a coefficient of -0.00092 (SE = 0.00212, $p = 0.0066$), Environmental -0.00174 (SE = 0.00168, $p = 0.031$), Social -0.00120 (SE = 0.00194, $p = 0.0537$), and Governance -0.00113 (SE = 0.00112, $p = 0.0316$). This implies that higher ESG scores are associated with a reduction in profitability within Asian firms, aligned with literature.

The MG estimator, which allows for firm-level heterogeneity, also shows negative coefficients: Total ESG -0.00293 (SE = 0.00383, $p = 0.045$), Environmental -0.00377 (SE = 0.00320, $p = 0.0242$), Social -0.00218 (SE = 0.00365, $p = 0.0554$), and Governance -0.00058 (SE = 0.00202, $p = 0.0770$). This is consistent with PMG findings, but they are weakly significant at the 10% level. Environmental and Total ESG remain statistically significant at normal levels, whereas Social and Governance are only marginally significant.

4.6.4: Pooled Mean Group & Mean Group Estimators (Panel ARDL) - Asian Firms

Dependent Variable: Tobin Q

Spec (x)	Long-run (PMG) β	SE (PMG)	P-value (PMG)	Long-run (MG) β	SE (MG)	P-value (MG)
Total ESG	-0.00165	0.00616	0.6914	0.03321	0.03095	0.2730
Environmental	0.00197	0.00484	0.8321	0.01472	0.01864	0.4240
Social	0.00124	0.00528	0.8754	0.03721	0.05250	0.0420*
Governance	-0.00151	0.00268	0.0146*	0.01094	0.01668	0.0513*

Table 5.3.5: This table reports the long-run coefficients (β), standard errors (SE), and p-values from the Pooled Mean Group (PMG) and Mean Group (MG) estimators. The independent variables are Total ESG, Environmental, Social, and Governance scores. ‘*** indicates $p < 0.01$ ’ (e.g highly significant), ‘** indicates $p < 0.05$ ’ (e.g significant at 95% confidence), ‘* indicates $p < 0.10$ ’ (e.g marginally significant at 90% confidence), ‘no star’ indicates $p \geq 0.10$ (e.g no statistical significance).

Total ESG has a positive but insignificant coefficient (PMG: 0.00165, $p = 0.691$; MG: 0.03321, $p = 0.273$). While it is negative, it indicates that the market may not consistently reward overall ESG performance across firms. The environmental pillar shows that coefficients are again positive but insignificant under both PMG (0.00197, $p = 0.832$) and MG (0.01472, $p = 0.424$). This implies that environmental practices alone are not strongly valued by investors in the long run, at least not uniformly across firms.

The social score under the PMG shows that the effect is small and insignificant (0.00124, $p = 0.875$). Interestingly, the MG estimator shows a positive and significant long run effect (0.03721, $p = 0.042$). It shows that the social score depends on the context for the firm, and can have a positive impact with market based valuation. The governance score shows that the PMG estimate is slightly negative (-0.00151 , $p = 0.0147$) as well as the MG estimate (-0.01094 , $p = 0.0513$). It indicates that governance has a negative impact overall and not valued by investors. Consistent with previous findings.

5.1: Discussion & Findings

The purpose of this research was to examine whether the financial impact of Environmental, Social, and Governance (ESG) has an impact on firm profitability in Europe and Asia, to see whether its universal or whether it is shaped by regional and firm context, without restricting it to highly capitalized firms. While prior research studied the relationship between ESG and financial performance, these findings are derived from highly capitalized firms (e.g top 100 firms in a stock exchange), developed countries, or global samples. Not many studies analyzed whether the impact was shaped by regional context or firm context, using a comparative between Europe and Asia, with a single comparative analysis using equal quantitative variables and metrics and there was no prior research supporting whether the impact is universal or context dependent. This is important in order to bridge the gap between the developing and developed world, in order to see the underlying unbiased differences to determine what policies can be implemented to foster development in the emerging world.

The empirical analysis shows substantial regional differences in the relationship between ESG performance and firm performance across Europe and Asia, both in terms of profitability measured by ROA and market-valuation measured by Tobin's Q. These differences provide insight to how regional and institutional contexts shape the financial implications of sustainability practices.

From the correlation analysis, European firms exhibit stronger and more positive relationships between ESG measures and firm value than Asian firms. An example of this can be seen in where the Tobin's Q is positively correlated (significant statistically) with the composite ESG score in Europe ($r = 0.141$, $p < 0.05$), while the same relationship is poorly correlated in Asia ($r = 0.04$). In Europe, Tobin's Q is strongly related to ROA ($r = 0.946$, $p < 0.01$), and firm size shows a positive correlation with ESGCS ($r = 0.557$, $p < 0.01$), this implies that larger European firms not only have the resources to invest in sustainability initiatives (e.g to meet ESG goals) but are also rewarded for it in market valuations and is in line with literature (Waddock and Graves, 1997). In contrast, Asian firms demonstrate weak and insignificant relationships between ESG and firm performance, with having ($r = 0.01$) to ROA, and ($r = 0.04$) with Tobin's Q. This implies that the ESG engagement in Asia does not translate into measurable financial benefits for the firm nor impact firm performance, due to the differences in ESG regulations, disclosures, market behavior and other regulatory measures (Lan and Lim, 2025).

The panel regression analysis provided a more nuanced picture through controlling for firm specific characteristics as control variables (e.g. firm size and leverage) and unobserved heterogeneity. The firms in Europe show a positively and highly significant total ESG score, in both FE and RE models for ROA (0.0008*** and 0.0006***), this reinforces the argument that the ESG engagement has an effect on firm profitability, supported through various research. This is consistent with MG findings ($\beta = 0.00775$, $p = 0.047$), this suggests that ESG's impact on profitability is also dependent on firm contexts and not a universal relationship. The environmental and governance scores in Europe show consistent positive effects on ROA, while the social dimension's impact is weaker and only shows significance in the random effects but not in the fixed effects. This suggests that the financial benefits of the ESG impact may take a longer time period to reflect. The market based performance is also similar, the total ESG score, environmental score, and social score all have significant positive associations with Tobin's Q, while governance shows mixed results. This aligns with studies that confirm a significant relationship between ESG performance and firm performance, such as (Ma'in et al., 2022; Aydoğmuş et al., 2022; Deb et al., 2025). PMG and MG estimators were used (panel ARDL) in order to understand whether the trend is universal or if it is context dependent. Interestingly, the PMG estimation in Europe showed only the social pillar significant ($\beta = 0.000091$, $p = 0.038$) and MG was insignificant. The divergence between the PMG and MG indicates that and MG indicates that impact of the social score is not universal, and is firm context dependent. Total ESG was positively associated with ROA ($\beta = 0.00775$, $p = 0.047$), as were environmental ($\beta = 0.01903$, $p = 0.018$) and governance ($\beta = 0.00613$, $p = 0.016$) scores.

Interestingly, Tobin's Q and Environment have seen to have a significant negative MG Correlation ($\beta = -0.2233$, $p = 0.038$), which implies that for some firms, the environment can lead to a lower market based performance due to the higher costs for environmental initiatives. It is necessary to understand that this is not a uniformed correlation, rather it is a context dependent correlation, meaning that there are some firms within Europe that have a negative correlation with Environmental initiatives.

In contrast, the firms in Asia show that the ESGCS has a marginally significant negative effect on the ROA in the FE model (-0.0003^* , $p < 0.1$) and no statistical significance in the RE model. This suggests that the firm's ESG initiatives or compliance with ESG measures, reduce firm profitability due to the high costs

associated with implementing the measure. This is aligned with the trade-off theory which suggests that ESG imposes additional costs which can lower profitability. This is also consistent with PMG and MG findings which show that the ROA decreases with ESGCS ($\beta = -0.00092$, $p = 0.0066$).

The environmental pillar shows a consistent and significant negative effect on ROA in both the FE and RE models, (-0.0003^{**} and -0.0002^{**} , respectively), this aligns with literature suggesting that environmental initiatives can increase operating expenses (Auer and Schuhmacher, 2016). The social and governance score remains statistically insignificant for ROA. and environmental ($\beta = -0.00174$, $p = 0.031$). Tobin's Q shows all ESG components in Asia are insignificant in both FE and RE models. This indicates that there is no benefit to the market valuation of the firm from the ESG performance in Asian firms.

The estimators (PMG and MG) from panel ARDL were further used to determine whether impact was universal or was it context dependent. PMG revealed negative significance for total ESG ($\beta = -0.00092$, $p = 0.0066$) and environmental ($\beta = -0.00174$, $p = 0.031$), supporting the evidence by the regression analysis (RE and FE). It is interesting to see that for Tobin's Q, the MG estimator identified a positive and significant effect for the social score ($\beta = 0.03721$, $p = 0.042$), but why does it signal a positive effect for the social score? It is important to understand that while the social score is positively determined by the MG only, this indicates that a positive relationship between social score and Tobin's Q exists, but it is dependent on the firm contexts, suggesting that this relationship exists in certain firms and not a uniform observation in the data. This does not imply there is a positive correlation overall between social score and market based valuation in Asia, rather it only implies that while this correlation exists, it only does so in limited firms and is highly dependent on firm context. If it were to be a uniform trend, it would show a highly significant effect in PMG and MG, both showing the same trend in the regression analysis.

The differences between both regions, Europe and Asia, highlight the role of regional economic structures, ESG integration maturity as well as regulatory policies. Europe has stronger regulatory frameworks, more established ESG disclosure requirements, and there is an increased investor demand for ethical investments, or "green investments," which suggests reinforcing the ESG-performance linkage with firm performance (Clark et al., 2015). In Asia, ESG reporting standards and investor focus on sustainability is less, ESG initiatives in Asia are linked with an inverse relationship, implying that ESG initiatives can increase costs and do not benefit the firm's profitability or financial performance.

The findings indicate that ESG's impact is not universal, but contextual. While the common notion research circulates around is ESG being seen as a tool to increase firm market based value and profitability, this is not always the case. In Europe, ESG enhances both profitability and valuation, consistent with stakeholder theory (Freeman, 1984) and shared value perspectives (Porter and Kramer, 2011). In Asia, ESG appears more as a cost than a benefit, reducing profitability, but the MG relationship in Asia shows that within certain firm contexts, there is an aspect of Social score being rewarded, but this is not an overall trend and highly dependent on the firm context. The divergence between PMG and MG estimators further emphasizes this contextuality. In Europe, MG results suggest that while firms differ, ESG positively influences long-run performance for many. In Asia, however, even MG estimations reveal weak or negative effects, indicating that ESG is not embedded sufficiently within institutional frameworks to consistently generate value, but it is rewarded in certain firm contexts.

This contrast directly addresses the gap in literature. Much of the empirical evidence in meta analyses (Friede et al., 2015) derives from developed contexts and is limited to highly capitalized firms, which risks overstating universality.

6.1: Conclusion of Study

This research was to examine the impact of Environmental, Social, and Governance (ESG) on a firm's financial performance through a cross-regional comparative analysis between Europe and Asia, and to examine whether the impact is shaped by regional context or firm context.

The findings show that ESG's financial impact is shaped by regional context. In Europe, ESG engagement enhances both profitability and market valuation overall. It aligns with the stakeholder theory (Freeman, 1984), suggesting that investor demand and meeting stakeholder needs is rewarded, and correlated with a higher financial performance. While this trend does exist, it does mean this would be the case for all regions. The results in Asia show that firms reveal weak and negative ESG performance relationships, and it emphasizes that ESG initiatives in Asia are seen as a burden for firms as evident by the negative correlation. The evidence from the PMG and MG estimators reinforces this central point: ESG effects are not universal but contingent. The PMG estimator, which assumes a common long run relationship across firms, suggests that ESG has little to no consistent positive effect in Asia. While in contrast the MG estimator which allows for firm level heterogeneity shows that some firms do experience gains in profitability. This divergence is important, as it shows that firm context does matter, as not all firms respond to ESG in the same way.

However, the overall patterns are still regionally defined despite the micro level relationship between ESG and financial performance on the firm level, which a few firms can exhibit. In Asia, the overall trend is negative, despite a few firms showing positive outcomes on the micro level. This indicates that while firm context influences outcomes, it is heavily shaped by regional context, firm level differences matter, but the regional backdrop determines whether ESG is broadly a driver of value or a burden.

While Europe provides evidence that firms are rewarded by ESG initiatives, Asian firms see it as a burden, ESG may operate as a cost rather than a benefit. The implication is clear: ESG's financial impact is not universal, but deeply embedded in the institutional and regional contexts within which firms operate.

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