

**The relationship between ESG disclosure and Corporate Financial Performance: A  
Comparative study among Developed and Emerging Markets Companies**

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## **ABSTRACT**

This study examines the impact of companies' environmental, social and governance (ESG) disclosure on corporate financial performance. It also compares this relationship among developed and emerging markets companies. The study was based on data on ESG scores obtained from Bloomberg. The sample data consisted of information from 2145 developed and 2023 emerging companies from 2015 to 2022. Using a Fixed-Effects panel regression model, the research results indicate that developed market companies represent higher ESG combined and sub-component scores than emerging market companies. This study finds that developed market companies' ESG performance is positively associated with financial performance (ROA) and market valuation (Tobin's Q). Companies in emerging markets showed a positive relationship between ESG scores and market valuation (Tobin's Q). Results also indicated a neutral relationship between ESG initiatives and emerging markets companies' ROA. Thus, the study implies that ESG investment is still in the early stage in emerging markets with room for growth, while developed market ESG performance is leading the way in terms of its impact on company performance. The results indicate that whilst the market recognises the potential benefits of ESG investment, it still has some way to go regarding translation into the company's book performance. This has significant implications for investment decisions. This study fills an existing gap in literature in understanding the relationship between company performance and investment in ESG especially as it pertains to the difference in this relationship between companies in emerging and developed economies.

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## **LIST OF ABBREVIATIONS**

CFP – Corporate Financial Performance

CG – Corporate Governance

CSR – Corporate Social Responsibility

ESG – Environmental, Social and Governance

EU – European Union's

ENV – Environmental

FE – Fixed-Effects

GEIS – Global Equity Index Series

GHG – Greenhouse Gas

G-Index – Governance Index

GICS – Global Industry Classification Standard

GRI – Global Reporting Initiative

ICB – Industry Classification Benchmark

IIRC – International Integrated Reporting Council

RE – Random Effects

SCI – Stakeholder Influence Capacity

SRI – Socially Responsible Investing

OLS – Pooled Ordinary-Least Squares

## CHAPTER 1: INTRODUCTION

The need for companies to proactively assess the impact of their environmental, social and governance (ESG) practices has increased significantly in the early 21<sup>st</sup> century (Huang, 2021). The 2008 Global Financial Crisis highlighted the need to push for higher levels of non-financial information disclosure, which is essential for investors and stakeholders to make fair capital allocations and avoid any social and market concerns. Indeed, sustainability issues have become a central theme for global organisations, while companies across the globe are developing strategies to actively contend with pollution, water use and climate change issues. In addition, companies are expected to tackle concerns pertaining to worker rights and the overall community impact of their business operations. This has led to the promulgation of a myriad of rules, regulations and initiatives concerning sustainability disclosure, which has compelled companies to monitor and disclose their ESG performance to its stakeholders. Over the last two decades, there has been a growing emphasis on the ESG disclosure of companies, thus extending companies' goal of maximising shareholder wealth to fulfilling various stakeholder expectations. Although these concerns have originated mostly from developed economics, the pressures from globalisation and a relatively weaker institutional investment environment require companies based in emerging markets to address these challenges comprehensively and gradually.

Meanwhile, the crucial question that companies and shareholders focus on is whether ESG disclosure can be turned into positive firm performance (Alareeni & Hamdan, 2020). Previous research has an increasing focus on ESG disclosure's impact on the developed market. Most of these studies<sup>1</sup> focus on a single dimension of ESG and are mainly based on developed market companies. A limited number of ESG studies focus on all three dimensions of ESG and their impacts on Corporate Financial Performance (CFP) in a single setting. More importantly, the findings of existing studies include conflicting perspectives and inconclusive findings on whether ESG disclosure and its dimensions have positive, negative or no impact on CFP.

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<sup>1</sup>Examples include research performed by Brammer, Brooks & Pavelin (2006) and Menz (2010), Eccles, Ioannou & Serafeim (2014), Alareeni & Hamdan (2020), (Ting et al., 2020).

Owing to the growing academic and practitioner interest in the field of ESG, there is a need to do a comprehensive assessment and synthesis of research activities on the impacts of the ESG score and its three sub-components named environmental (EVN), corporate social responsibility (CSR) and corporate governance (CG) disclosure on CFP. Many studies only consider the impacts of ESG as one single component instead of evaluating the relationship from the perspective of three dimensions. This paper will explore the impact of ESG disclosure practice on CFP in comparison between developed and emerging markets while expanding the assessment into the three dimensions of EVN, CSR, and CG.

The study contributes to ESG prior literature in four different ways. First, the study selected data from Bloomberg for a longer period (from 2015 to 2022) than most prior studies. Secondly, the study examined the impact of ESG scores from all dimensions (ESG, CSR and CG) on CFP (ROA and Tobin's Q measures). Thirdly, the study grouped the listed companies into two markets based on the FTSE Developed Index and the FTSE Emerging Index. This is a crucial point of the investigation, as a large portion of the prior studies were in developed economies, where this study contributes to distinguishing the impacts between different market conditions. Lastly, the study tested the impacts ESG disclosure and its three sub-components (EVN, CSR and CG scores) on CFP among developed and emerging markets to identify the key driver affecting the financial performance. Also, the study incorporates firm size, leverage and capex as control variables. A limitation of this paper is that due to data constraints, the study excluded industry classification. Some companies' nature of operation may lead to levels of environmental sensitivity, which may impact financial performance differently.

This paper finds that developed markets companies presented higher ESG scores in all three sub-components across all years than emerging markets companies. Furthermore, companies in developed markets reflected a significant positive association between ESG and CFP for both financial and market valuation measurements (ROA and Tobin's Q). Emerging markets companies only had a positive relationship between ESG and market valuation Tobin's Q, while all three sub-components and ESG scores presented a neutral relationship with ROA. This study may contribute to how participants in the market should consider the impact of ESG disclosure on CFP. The findings of the study could significantly benefit various stakeholders in society, including scholars, corporate shareholders, regulators, and policymakers, when making decisions in both developed and developing markets about ESG investment.

Additionally, the guidelines can help global investors enhance their understanding of the importance of ESG disclosure.

The remainder of this paper is divided into five chapters. Chapter 2 discusses the literature review and overview of ESG disclosure. Chapter 3 shows the data selection and methodology. Chapter 4 evaluates the descriptive data results and the panel regression model results and analysis. Lastly, Chapter 5 presents the conclusion of the study and Chapter 6 highlights the study's limitations and recommendation for future studies.

## **CHAPTER 2: LITERATURE REVIEW AND HYPOTHESIS FORMULATION**

Chapter 2 reviews prior studies on the relationship between corporates' ESG disclosure and financial performance and existing studies dealing with the relationship between individual components of ESG and CFP. This chapter will also review the methodology used to analyse these relationships in prior literature.

### **2.1 Overview and Categorising ESG Disclosure**

The ESG concept has evolved steadily over the past few decades (Tansan et al., 2023) and over this time regulators in the US and EU established sustainability disclosure standards for large public companies. With early 200 nations having signed on to the Paris Agreement goal to achieve net-zero emissions by 2050, the pressure on listed companies to conform to ESG standards has increased significantly (Camilleri, 2015). Conforming to ESG goes beyond just ticking boxes, it is about making a difference at every level, from individuals to corporations to the entire community (Ismail, 2009). According to Fatemi, Glaum & Kaiser (2018), delivering sustained results can drive value and fuel company growth while also strengthening the environment and societies. The environmental factor within ESG refers to a company's environmental impact, including direct and indirect greenhouse gas emissions, waste management, and energy efficiency to combat global warming by reducing emissions and decarbonising. The social factor is linked to relationships with stakeholders such as employees, investors, consumers and community involvement. Corporate governance relates to the rules and principles that empower the company, such as aligning management incentives with

stakeholder expectations, protecting shareholders' rights, and implementing internal controls to promote transparency and accountability (Bhagat & Bolton, 2013; Ting et al., 2020).

ESG disclosure has become more accessible and transparent, with standardised measurement methods established by various institutions and agencies (Alareeni & Hamdan, 2020; Bahadori, Kaymak & Seraj, 2021; Ruan & Liu, 2021). A KPMG survey (KPMG, 2008) showed that in 2006, only half of the companies disclosed their social and environmental impacts in separate Sustainability or ESG reports, while in 2008, this rose to over 80%. The result of this survey indicates that not only has ESG become more accessible and transparent through standardised reporting, but companies have also shown greater commitment to disclosure. The global financial crisis in 2008 triggered increased focus on ESG, highlighting concerns about corporates' credibility, ethical behaviour, and accountability to all stakeholders (Nicholson, Kiel & Kiel-Chisholm, 2011). Investors are paying more attention to the availability and credibility of corporate ESG performance as an indicator of risk when making investment decisions (Ioannou & Serafeim, 2017). Higher levels of disclosure may therefore lead to better communication between management and equity markets, with the company's commitment to ESG better reflected in stock prices (Jiao, 2011; Grewal, Riedl & Serafeim, 2018). Lack of disclosure could damage corporate reputation, integrity, and investors' sentiment at a high cost to corporate (OECD, 2004). The range of integrated reporting has become wider and deeper, providing additional detail to investors on non-financial reporting such as ESG disclosure, adding value to corporate disclosure transparency (Alqallaf & Alareeni, 2018).

Authorities have been implementing mandatory compliance requirements on corporate ESG disclosure to enhance the transparency of how corporates address issues such as energy crisis, water shortage, human rights, employment equity and shareholder rights and many more (Camilleri, 2015; U.S. Securities and Exchange Commission, 2022). As an example, the EU has mandated listed companies to disclose ESG info alongside financial reporting (Camilleri, 2015). Companies are now following the Global Reporting Initiative (GRI) guidelines and the International Integrated Reporting Council (IIRC) framework which was published in 2013 (Cheng, Ioannou & Serafeim, 2014; Fatemi, Glaum & Kaiser, 2018). This has led to more companies adopting ESG disclosure globally. As a result, the global market has shown a growing interest in analysing the effectiveness of ESG disclosure (Krueger et al., 2021). The above review explains the reasons why market participants and researchers have become

increasingly interested in ESG disclosure's impacts while there is an emerging research interest in the relationship between ESG and CFP (Kitzmueller & Shimshack, 2012a).

## **2.2 Studies of the relationship between ESG and CFP**

There has been a growing interest in understanding the relationship between ESG disclosure and CFP (McWilliams & Siegel, 2001). In the past, it was believed that investments in environmental or social responsibility activities beyond legal requirements would increase costs and reduce company value, as the main focus was on maximising owners' profits (Friedman, 2007). However, there has been a shift towards a broader stakeholder approach, where the interests of employees, investors, the government, and society are considered. This shift, known as Stakeholder Theory, aims to create value for a wider set of stakeholders than just the business owners (Friedman, 2007). At the same time, the model highlighted that corporations that cannot earn profits legally, ethically and responsibly do not deserve to survive, nor can our planet afford for business to continue to treat their shareholders as just another environmental factor to be managed (Agle et al., 2008). This change has been particularly notable since the 2008 Global Financial Crisis, which highlighted the extensive impact of corporate failure. Bassen & Kovács (2020) suggested that ESG indicators provide valuable information not typically found in standard accounting data and financial reports. Therefore, comprehensive ESG disclosure information is crucial for studying its impact on CFP (Fatemi, Glaum & Kaiser, 2018).

The evidence from empirical studies has established a positive relationship between ESG factors and CFP. Orlitzky, Schmidt & Rynes (2003) conducted a meta-analysis of 33,878 samples from 52 studies and demonstrated a high correlation between ESG disclosure and accounting-based measures of CFP. Eccles, Ioannou & Serafeim (2014) monitored 190 US companies and provided evidence that companies with high sustainability significantly outperform their counterparts in terms of stock market and accounting performance over the long term. On top of that, Nollet, Filis & Mitrokostas (2016) showed a U-shaped relationship between ESG disclosure and accounting-based CFP, suggesting that ESG investments pay off only after a certain threshold amount of investments and achievements regarding ESG have been made. Alareeni & Hamdan (2020) analysed US S&P 500-listed companies and found that ESG positively affects a company's valuation performance measures such as ROA, ROE, and Tobin'Q. They also expanded the study into three pillars of ESG and their relationships with CFP measurement. However, it's important to note that the majority of the studies were based

on US companies' performance, which may not be applicable to emerging markets (Ting et al., 2020).

The evidence from Korea indicates that ESG practices are positively associated with a company's stock market performance. This finding highlights the importance of substantial policy and welfare implications in the market, supported by the government's critical role in promoting ESG activities. The study was based on 705 Korean companies from KOSDAQ for the period between 2010 and 2015. Furthermore, it was found that the effect of CSR is weaker for environmentally sensitive industries in Korean financial markets, while the effect of CSR is stronger for special business groups in Korea known as chaebols, which are family-owned business conglomerates (Yoon, Lee & Byun, 2018). This study emphasises the aspect of how different types of businesses may impact the association between ESG disclosure and CFP.

In contrast, only a few studies have found a negative relationship between ESG factors and CFP in developed markets. Brammer, Brooks & Pavelin (2006) conducted a cross-sectional regression analysis in the UK, using data from the FTSE All Share Index UK constituents. They found that companies with greater environmental and social disclosures offered poor financial rewards. However, it is important to note that this study was based on a short-term (1-year stock return) analysis, and the global stock markets experienced significant falls during the year of the study. Some key takeaways from this study include the recommendation for researchers to avoid databases affected by abnormal financial conditions, such as the global financial crisis, and to consider longer time-series models to better capture the evolving nature of ESG markets. Dhaliwal et al. (2014) conducted a study to explore the connection between ESG disclosure and the equity costs of capital across 31 countries. The countries were categorised into two groups based on their stakeholder orientation. The study revealed a negative relationship between ESG disclosure and the cost of equity capital, particularly in stakeholder-oriented countries. Additionally, only few of prior studies found no significant link between the overall level of ESG disclosure and the company's value, cash flows, or cost of capital (Horváthová, 2010; Plumlee et al., 2015). However, Plumlee et al. (2015) discovered that high-quality and soft ESG disclosure is significantly associated with both cash flows and the cost of capital components of company value. This suggests the importance of considering control variables that may impact the results when conducting such analyses.

The existing body of literature presenting the main findings on the relationship between ESG disclosure and CFP is inconclusive. The results are constantly evolving and require periodic analysis based on various market dynamics and performance measurements. Moreover, most studies have focused on developed markets, and their findings may not apply to developing markets (Dowell, Hart & Yeung, 2000). Developed and developing markets differ significantly in terms of social, cultural, regulatory, and managerial practices (Ting et al., 2020). There is substantial amount of research has been conducted on the ESG-CFP relationship in developed markets, much less is known about developing markets and the comparison between the two. Additionally, the majority of past studies focused on the overall ESG dimension, with only a limited number of research considering the breakdown of environmental, social, and governance factors separately and their individual associations with CFP. The role of each ESG component and its potential connection with CFP is understudied, leading to a research gap in this area based on existing studies of the ESG-CFP relationship.

This study has two basic purposes, arising from two key themes identified in previous research. The first objective is to explore the relationship between ESG and CFP in both developed and developing markets. The second objective builds on the first by assessing the impact of each ESG component—environmental, corporate social responsibility, and corporate governance—on CFP through a more detailed analysis of individual ESG scores.

### **2.2.1 Relationship between Environmental Disclosure and company's performance**

The global challenges of climate change and global warming require significant attention. Researchers are increasingly focusing on measuring corporate environmental disclosure, as neglecting environmental factors in strategic management could impact long-term competitiveness (Porter & Kramer, 2006). However, research on the relationship between environmental disclosure and company performance has not yet produced definitive conclusions (Moneva & Ortas, 2010).

In the field of finance, there have been limited studies exploring the relationship between environmental disclosure and company performance. Moneva & Ortas (2010) conducted an analysis of sample data from 23 European countries and uncovered a positive association between environmental disclosure and company performance. The study also indicated that increased environmental disclosure could enhance a company's efficiency by strengthening its

financial position and meeting stakeholder demands (Moneva & Ortas 2010). Dowell, Hart & Yeung (2000) identified a connection between environmental responsibility and financial performance, suggesting a positive correlation over the long term. This discovery was confirmed by van Beurden & Gössling (2008). Dowell, Hart & Yeung (2000) also revealed that companies adhering to a single, rigorous, and globally high standard of environmental practices tend to have a higher market value. Moreover, environmental regulations can lead to sustained revenue improvement for companies by incentivising a focus on reducing production costs while simultaneously increasing customer satisfaction and sales growth (Karagozoglu & Lindell, 2000). Consequently, the company's embrace of environmentally friendly operations could represent a mutually beneficial "win-win" solution for both the company and society.

In contrast, some research presented evidence indicating a negative relationship between environmental disclosure and company performance (Smith, Yahya & Marzuki Amiruddin, 2007). Others, such as Elsayed & Paton (2005) that assessed financial performance using ROA, return on sales, and Tobin's Q, found limited evidence of the impact of environmental disclosure and regulations on these companies' performances. Furthermore, other studies have noted a neutral association between environmental disclosure and a company's performance (Nakao et al., 2007; bin Abd. Rahman, binti Yusoff & binti Wan Mohamed 2009).

The evidence presented in this section suggests that previous studies have not provided conclusive findings regarding the relationship between environmental disclosure and the company's performance. This may be mainly due to variations in study periods and the use of different financial performance measurements, which may impact the assessment results. Most studies have focused on samples from developed markets, particularly in the United States of America and European countries, with little attention given to emerging markets. Additionally, there is limited comparison between the two market types. To address the gaps, this research aims to conduct a comprehensive study comparing the relationship between environmental disclosure and CFP with a focus on the differences between developed and emerging markets.

### **2.2.2 Relationship between Corporate Social Responsibility disclosure and company's performance**

Before examining the connection between CSR disclosure and a company's performance, it is important to understand how CSR is defined in the market. There are various viewpoints on CSR. For example, Commission (2003) defined CSR as a concept where companies voluntarily

integrate social and environmental concerns in their operations and interact with stakeholders. The World Business Council stated that “CSR is the commitment of business to behave ethically and to contribute to sustainable economic development by working with all relevant stakeholders to improve their lives in ways that are good for business, the sustainable development agenda, and society at large” (Kitzmueller & Shimshack, 2012:53). Furthermore, McWilliams & Siegel (2001:505) defined CSR as “the fulfilment of responsibilities beyond those dictated by markets or laws” coupled with “self-regulation” (Calveras, Ganuza & Llobet, 2007:720). In essence, the CSR concept emphasises a company’s responsibilities to all stakeholders and society as a whole in observable and measurable behaviour or output, which goes beyond the legal or regulatory requirements of the relevant market(s) or economy(s) (Kitzmueller & Shimshack, 2012). Common indicators of adopting socially responsible practices include but are not limited to elements like employment equity, diversity and skill development, human rights, health and safety, and community development (Kitzmueller & Shimshack, 2012).

Over the past few decades, an increasing number of companies have been actively engaging in CSR disclosure, prompting researchers to explore the underlying motivations and the potential benefits for these companies. Beyond meeting regulatory obligations, a robust commitment to social responsibility can significantly bolster a company's reputation, thereby enhancing its Stakeholder Influence Capacity (SIC) (Fombrun, Gardberg & Barnett, 2000). Additionally, CSR initiatives are found to positively impact labour relations, talent acquisition, employee retention, and cost-efficiency (Burke & Logsdon, 1996). From a business standpoint, embracing CSR practices can lead to improved productivity, heightened consumer loyalty, and enhanced market credibility, fostering opportunities for geographical expansion (Burke & Logsdon, 1996). As a result, researchers are delving deeper into the multifaceted impact of CSR disclosure on CFP, aiming to reconcile the conflicting findings in existing studies.

Numerous studies have highlighted the positive influence of CSR on CFP from various angles. Early research by Donaldson & Preston (1995) indicated that increased disclosure of CSR activities enhanced a company's value, resulting in improved financial performance. Subsequent studies delved deeper into the impact, with findings suggesting that corporate philanthropy contributes to consumer satisfaction and revenue growth (Lev, Petrovits & Radhakrishnan, 2010). Additionally, it was observed that companies with better CSR disclosure exhibited the highest CFP, supporting the argument that Socially Responsible

Investing (SRI) underlies the ability to translate social responsibility into profit (Barnett & Salomon, 2012). Furthermore, companies with superior CSR performance tend to attract dedicated institutional investors and analyst coverage (Dhaliwal et al., 2011). Building on these findings, subsequent research provided evidence that companies initiating CSR experienced a subsequent reduction in the cost of equity capital, and those with CSR disclosure were able to raise a significantly larger amount of equity capital than non-initiating companies (Dhaliwal et al., 2014). Similarly, Taneja, Taneja & Gupta (2011) concluded that CSR practices can serve as corporate strategies to enhance financial performance.

While Menz (2010) proposed that CSR practices can significantly enhance financial performance in developed markets, studies involving companies from Asian emerging economies also revealed a positive correlation between CSR practices and financial performance, particularly in less-developed capital markets with lower information diffusion (Su et al., 2016). This finding holds significant importance for ESG studies in emerging markets, especially considering the historical focus on developed markets data. A more in-depth study conducted by Barnett & Salomon (2012) suggested a U-shaped relationship between CSR and the company's performance, indicating that early-stage companies with low CSR practices may have better financial performance than companies with moderate CSR practices due to the cost of CSR, but then this relationship turns around at some point when investment in CSR starts paying off. There has been very little evidence in prior literature that confirmed this theory.

The discussion above highlights the more positive association between CSR and corporate financial performance from multi-dimensions in developed markets. However there is the need for further research to better understand the relationship between CSR disclosure and company performance in emerging markets. There is also scope for further studies that draw comparisons between this relationship in emerging and developed economies. A constraint in the comparative study is the lack of a standardised measurement of CSR activities. This paper aims to investigate the impact of CSR disclosure on company performance and conduct a comparative analysis of these relationships between developed and emerging markets using the Bloomberg CSR scores as a standardised measure of CSR activities.

### **2.2.3 Relationship between Corporate governance disclosure and company's performance**

Corporate governance disclosure plays an important role. After the financial crisis of 2008, many companies began to pay more attention to strengthening their transparency and disclosure levels in corporate governance. Poor corporate governance is seen as one of the main sources of financial crises (Nollet, Filis & Mitrokostas, 2016). Companies with limited agency costs can continue as a going concern, and with effective corporate governance practices can improve financial performance in the best interest of stockholders and other interested parties (Fama & Jensen, 1983). The following paragraphs will outline the relevant results of existing literature.

The majority of studies have shown that companies with good corporate governance practices tend to have better performance. Two main areas of research have looked into the positive relationship between corporate governance disclosure and a company's performance. One area focuses on specific aspects of governance such as board composition, ownership structure, and executive compensation disclosure. The other area combines various attributes to create measures of corporate governance quality and assesses their relationship with company performance (Ting et al., 2020). In a significant and frequently referenced paper, (Gompers, Ishii & Metrick, 2003) used 24 equally weighted governance rules to create a "Governance Index" (G-Index) to represent shareholder rights and governance structure at around 1500 large companies in the 1990s. The findings from this research indicated that companies with strong shareholder rights and better governance practices had higher company value, higher profits, higher sales growth, lower capital expenditure, and made fewer corporate acquisitions (Gompers, Ishii & Metrick, 2003). Building on these key results, subsequent studies have delved further into the topic. For instance, it has been found that companies with weak governance practices experience lower equity returns, lower labour productivity, worse operating performance, and lower company value, but only in non-competitive industries (Giround & Mueller, 2011). Additionally, the association between board independence and a company's operating performance has changed over time. In the post-2002 period, there is a positive and significant relationship where company performance is positively related to the type of stock ownership of board members, whereas before 2002 the relationship was negative (Bhagat & Bolton, 2013). Furthermore, greater exposure to institutional shareholders combined with lower insider holdings would lead to high sales growth, providing further evidence that

well-managed corporate governance quality is positively correlated with a company's performance (Chung & Zhang, 2011).

The existing studies have started to shed light on how CG disclosure can have a positive impact on CFP. One limitation of previous studies is that they have only focused on data from developed markets, and the company's performance measurement has been limited to operating metrics such as revenue and profits, with less understanding of the impact on the company's valuation and return performance. This means that there is currently limited knowledge about the impact of CG disclosure on CFP in emerging markets. If researchers and market participants want to gain a better understanding of the differences in CG disclosure impact on CFP across different market environments, it is crucial to examine the comparison of the relationship between developed and emerging markets. This research will be a part of this paper, aiming to identify how CG practices in different markets condition the impact on the company's performance from return and valuation perspectives.

### **2.3 Studies in Emerging Markets**

Given the above-mentioned literature review, ample research exists addressing the ESG—CFP relationship only in developed markets, in terms of ESG as a whole and from the three ESG pillars. This section will focus on studies in emerging markets.

The sustainability movement, which originated in advanced economies, is now making its mark in emerging markets. This shift has captured the attention of international investors seeking to integrate ESG considerations into their investment approaches (Tansan et al., 2023). However, businesses in emerging markets are grappling with challenges stemming from the unpredictable nature of governmental policymaking and difficulties across economic, political, social, and environmental spheres (Pollard, Sherwood & Klobus, 2018). Pollard, Sherwood & Klobus (2018) also suggest that institutional investors are now exploring opportunities for higher returns by factoring in ESG strategies alongside traditional financial metrics. There is a growing interest in delving into the relationship between ESG and company performance in emerging markets, as historical studies on this topic are relatively scarce. Notably, conflicting research findings have emerged on whether ESG activities bolster or hinder company performance in emerging markets.

A recent study revealed a noteworthy connection between a company's financial performance and its ESG activities in emerging markets. The research, conducted by Bahadori, Kaymak, and Bahadori, Kaymak & Seraj (2021), involved a diverse sample of 600 companies from the MSCI Emerging Market Index across 24 leading emerging markets. Utilizing linear regressions on panel data between 2014 and 2018, the study indicated that higher ESG scores are linked to increased profitability. Moreover, the findings suggested that environmental and social scores have a positive impact on performance, while the governance component exhibited no association with company performance in terms of ROA. These findings were in line with similar findings by Mohammad & Wasiuzzaman (2021) who examined 661 listed companies in Bursa Malaysia from 2012 to 2017. Their research revealed that ESG disclosure positively influences company performance, particularly from a valuation perspective using Tobin's Q. The study also emphasised the importance of integrating ESG strategies into investment activities and value-creation initiatives to enhance regulatory frameworks, especially in emerging economies with limited ESG development (Mohammad & Wasiuzzaman, 2021).

While the mentioned studies found a positive relationship between the company's performance and investment in and disclosure of ESG, Ruan & Liu (2021), who conducted a comprehensive study using data from China's Shanghai and Shenzhen A-share listed companies, focusing on ESG from 2015 to 2019, reported a negative relationship. The study emphasised that this finding reflects the early stage of ESG activities in Chinese companies, leading to relatively high-cost pressure for listed companies, consistent with the U-shape relationship suggested by Barnett & Salomon (2012). As China is a key player in emerging markets, the study suggests that it can provide valuable insights into the effects of ESG in these markets. The study also highlighted the need to further explore the relationship between ESG activities, enterprise nature, and industry characteristics (Ruan & Liu, 2021).

Tansan et al. (2023) emphasise how the sustainability imperative is reshaping global competition. It underscores the potential for companies to capitalise on robust reputations in addressing ESG challenges in emerging markets, leading to increased growth opportunities, enhanced customer satisfaction, improved market access, greater investment capital, and access to top talent. The research also sheds light on the significant prioritisation of climate change and sustainability by consumers in emerging markets compared to those in developed markets. This valuable research highlights the need to explore further the relationship between ESG disclosure and company performance in emerging markets. The research underscores the

strong correlation between ESG scores of emerging market companies and key financial and valuation metrics (Tansan et al., 2023).

The relationship between ESG factors and CFP in emerging markets has not been well-established in the existing literature, with limited research conducted in the past. Most studies have focused on individual emerging countries, leading to a gap in the research that requires further exploration of emerging markets as a whole. However, the existing findings could be relevant to many other smaller emerging countries that are at a similar stage as China, Korea, and Malaysia, as well as other emerging economies where the regulatory frameworks and government support for ESG initiatives are relatively immature and lack standardisation compared to developed countries Brooks & Oikonomou (2018).

To address this gap, three key elements need to be considered in studying ESG and CFP in emerging markets. Firstly, this study will focus on the long-term observation and analysis of the effect of ESG activities on CFP, as existing studies have been based on relatively short periods. Secondly, the study will exclude large state-owned or family-owned entities in emerging markets, as well as companies with no experience in disclosing ESG-related data, to ensure accuracy and consistency in capturing ESG ratings for companies. Thirdly, the study will take into account the underdevelopment of ESG measurement in emerging markets compared to developed markets and will utilise standardised and institutionalised ESG score measurement by third parties in the analysis.

In addition, this study will also examine the relationship between each component of ESG and CFP, as most existing studies in emerging markets have focused on the combined aspect of ESG impact as a whole.

## **2.4 Review of Measurements and Models**

**Independent variable:** In prior studies, there were three leading global financial and non-financial data services providers, Bloomberg, MSCI, and Thomson Reuters, for ESG score measurement. Studies in emerging markets appeared to utilise less international standardised measurements for ESG disclosure. Given some of the special market conditions or limitations of disclosure which led to a lack of information, the studies for emerging markets sometimes use local ESG scores rating agencies, such as SynTao Green Finance ESG rating and Korean

Corporate Governance Services (Yoon, Lee & Byun, 2018; Ruan & Liu, 2021). Thomson Reuters Eikon ESG scores aim to measure a company's relative ESG performance based on company-reported data (Bahadori, Kaymak & Seraj, 2021). Bloomberg data presents ESG performance as Bloomberg's ESG disclosure scores are considered major indices to identify EVN, CSR and CG disclosure scores (Alareeni & Hamdan, 2020), this study will analyse not only ESG as a whole but also each component of the ESG. Bloomberg's quant model of ESG scores measurement supplies the advantage of the separate standardised score of EVN, CSR and CG scores, which is suitable to this study given one aspect of the analysis will be focusing on the effect from three dimensions of ESG (Bloomberg, 2020). Furthermore, Bloomberg's ESG scores are integrated into the company-reported data and ESG performance as a normalised benchmark for listed companies across multiple industries and regions, preferably for study among comparison between different markets and regions. Practically, Bloomberg data has broader access points and better data availability for researchers.

**Dependent variables:** When evaluating a company's performance, there are two categories of measurement. The first is the accounting-based performance perspective, which includes metrics such as revenue, company value, profits, sales growth, and cash flows (Karagozoglu & Lindell, 2000; Gompers, Ishii & Metrick, 2003; Lev, Petrovits & Radhakrishnan, 2010; Chung & Zhang, 2011; Plumlee et al., 2015). The alternative viewpoint is based on the company's valuation and/or return performance, such as ROA, ROE, and Tobin's Q (Elsayed & Paton, 2005; Alareeni & Hamdan, 2020; Mohammad & Wasiuzzaman, 2021), as well as the company's total share return, market value of equity, and book value (Brammer, Brooks & Pavelin, 2006). These are the common independent variables used to assess a company's performance in relation to ESG disclosure.

**Control variables:** The control variables in each previous study were chosen based on the specific focus of that study. Previous research has included variables such as company growth, profitability, company size, financial leverage, liquidity, operating cash flow, dividend yield, capital expenditure intensity, and research and development intensity as control variables (Alareeni & Hamdan, 2020; Mohammad & Wasiuzzaman, 2021; Ruan & Liu, 2021). In Chapter 3 the study outlines the control variables this study selects in the model as informed by prior research.

**Dummy variables:** Ting et al. (2020) utilised dummy variables to incorporate categorical elements by creating interaction terms between these variables and others. This approach allowed the researchers to explore how the relationship between dependent and independent variables varied across different categories. Given that this paper aims to investigate the relationship between ESG and CFP in developed and emerging markets, the inclusion of dummy variables will facilitate the comparison of the impacts of ESG performance on corporate financial performance within these markets.

### **Methodology:**

The analysis of the relationship between ESG and CFP has benefited from two major methodologies: meta-analysis and multiple regression analysis. Meta-analysis involves systematically combining and analysing results from multiple independent studies on ESG-CFP relationship topics. For instance, Orlitzky, Schmidt & Rynes (2003) conducted a meta-analysis of 52 studies with a total sample size of 33,878 observations to explore the correlation between ESG disclosure and accounting-based measures of CFP. This method aims to provide a quantitative summary or estimate of the overall effect size or relationship between variables across studies. Although meta-analysis increases the sample size and statistical power, enabling a more precise and reliable estimate of effects, it is important to note that heterogeneity across studies may limit the generalisability and interpretation of results.

On the other hand, many studies have utilised multiple regression models for analysis, to understand the relationship between the variables. This the preferred methodology in most prior studies. Studies employing multiple regression models include those by Yoon, Lee & Byun (2018), Alareeni & Hamdan (2020), Ting et al. (2020), Bahadori, Kaymak & Seraj (2021) and Ruan & Liu (2021).

Both meta-analysis and multiple regression models have contributed significantly to our understanding of the ESG-CFP relationship, providing valuable insights for future research and practical implications.

### **2.5 Summary of literature review**

Existing studies on the relationship between ESG factors and CFP have been inconsistent and inconclusive. Most studies in the past two decades have focused on developed markets, and

their findings may not apply to emerging markets. Different regions and countries have different regulations and policies regarding managerial rules, cultural implications, governance structures, urgent social challenges, and environmental conditions (Tansan et al., 2023). These factors influence a company's ESG strategy and can lead to variations in performance between developed and emerging markets.

There is limited research on the comparative study of ESG-CFP relationship between developed and emerging markets. As ESG disclosure requirements continue to evolve in both types of markets, ongoing studies are essential to fill the research gap and better reflect the relationship between ESG and CFP. For example, in March 2022, the U.S. Securities and Exchange Commission proposed rule changes to enhance and standardise climate-related disclosures in publicly listed companies' financial statements. This proposed change would require companies to disclose risks that are likely to have a material impact on their business, operations, or financial conditions and information about their direct and indirect greenhouse gas emissions. This regulatory change would impact companies' operations and financial performance, as companies would need to invest time and money in sustainability strategies to meet the disclosure requirements. These impacts remain unexplored.

With the world's top developed economies leading the way in ESG involvement in corporate operations and investments, it is inevitable that remaining markets will follow the trend; some have already done so. Therefore, continuous study of how the ESG-CFP relationship evolves and the comparison between developed and emerging markets is essential to provide insights to various stakeholders such as investors, corporations, and regulators. Furthermore, existing studies have focused more on ESG as a whole, with fewer studies evaluating the individual pillars of ESG in both developed and emerging markets. This study aims to analyse the relationship between ESG and CFP, as well as the three pillars of ESG, in both developed and emerging markets over a longer time frame.

## 2.6 Hypothesis

The above theoretical discussion and empirical evidence lead to the following hypothesis, which forms the basis of this study.

### *Hypothesis 1: ESG disclosure and CFP*

H1<sub>0</sub>: ESG disclosure is not positively associated with corporate financial performance as measured by ROA and TQ

H1<sub>a</sub>: ESG disclosure is positively associated with corporate financial performance as measure by markets and accounting measures

### *Hypothesis 2: EVN disclosure affects CFP*

H1<sub>0</sub>: EVN disclosure is not positively associated with corporate financial performance as measure by ROA and TQ

H1<sub>a</sub>: EVN disclosure is positively associated with corporate financial performance as measure by markets and accounting measures

### *Hypothesis 3: CSR disclosure affects CFP*

H1<sub>0</sub>: CSR disclosure is not positively associated with corporate financial performance as measure by ROA and TQ

H1<sub>a</sub>: CSR disclosure is positively associated with corporate financial performance as measure by markets and accounting measures

### *Hypothesis 4: CG disclosure affects CFP*

H1<sub>0</sub>: CG disclosure is not positively associated with corporate financial performance as measure by ROA and TQ

H1<sub>a</sub>: CG disclosure is positively associated with corporate financial performance as measure by markets and accounting measures

## **CHAPTER 3: DATA AND METHODOLOGY**

This chapter explains the research framework, encompassing sampling selection, data collection methods, and statistical approaches employed in this study to examine the potential correlation between ESG disclosure and CFP across developed and emerging markets.

### **3.1 Sample Selection and Data Sources**

A large dataset from Bloomberg was obtained to examine the designed hypotheses. The study sample of global publicly listed companies derived from the FTSE Emerging Index consisted of 2023 companies and the FTSE Developed Index of 2145 companies. The selected indices are both derived from the FTSE Global Equity Index Series (GEIS) and, therefore, represent a significant part of the respective exchanges globally and a significant part of the respective countries' economies. The FTSE Developed Index is a market-capitalisation weighted index consisting of the large and mid-cap companies in Developed markets, which covers 98% of the world's investable market capitalisation. The FTSE Emerging Index provides investors with a comprehensive list of the most liquid large and mid-cap companies in advanced and secondary emerging markets. The indices only included large and mid-cap companies and represent a significant part of the respective markets. The emerging market sample companies were from countries or regions such as China, India, Taiwan, Turkey, Brazil, and South Africa. Developed countries or regions are clustered over 25 countries including the USA, Japan, UK, Korea, Australia, Hong Kong, Germany, France and others. Furthermore, the sample data also includes the industry to which each company belongs. Stock markets typically categorise companies into sectors based on the nature of their business activities. They often use standardised sector classifications provided by industry classification systems like the Global Industry Classification Standard (GICS) or the Industry Classification Benchmark (ICB).

The data used in this study included company financial performance and market sentiment measures (ROA and Tobin's Q) and ESG disclosure scores (ESG combined disclosure scores and pillar scores of EVN, CSR, and CG disclosure scores). In addition, total assets, debt to equity, and capital expenditure to sales ratio for each company were collected as control variables. These variables are indicators of company size, leverage, and capital intensity, respectively.

Before 2015, companies rarely reported ESG disclosure score data publicly. As a result, the original sample data was collected from December 31, 2015, onward until December 31, 2022. The above data was sourced from Bloomberg.

Microsoft Excel was used to clean the dataset of missing values, restructure it from a wide to long data format, and lag the explanatory variables. The sample size was truncated due to missing values of some variables. The study is conducted on an unbalanced dataset, with the number of companies present in the sample ranging from 2023 to 2145 over the time period for emerging markets and developed markets, respectively. As a result, the final sample dataset contains 22443 observations, of which 11971 observations in emerging markets and 10472 observations in developed markets as detailed in Table 1. The dataset was then imported into RStudio, where all calculations, regression analyses, graphs, and tables were produced.

Table 1. Sample Process

	FTSE Emerging Index	FTSE Developed Index
Number of observations in original sample	16,192	17,136
Data shortage or missing data	2,832	5,505
Data loss because of taking natural logarithms of variables	1,389	1,159
Number of observations in final sample	11,971	10,472

## 3.2 Variable Definition

### 3.2.1 Independent Variables – ESG Disclosure Scores

The Bloomberg ESG disclosure score is based on the extent of a company’s Environmental, Social, and Governance disclosure. Bloomberg’s proprietary quant model is informed by frameworks, research, and analysis to reduce noise, normalize data, address size bias, identify peer groups, and aggregate from fields to top-level scores (Bloomberg, 2020). The score ranges from 0 for companies that do not disclose any ESG data included in the score to 100 for those that disclose every data point. Companies not covered by Bloomberg for ESG data will have no score and show as ‘N/A’, which was removed from the sample set due to incomplete information. The Bloomberg ESG disclosure score contains a consistent list of topics, data fields, and weights that apply across sectors and regions. Environmental, Social, and Governance pillars are equally weighted within the overall ESG disclosure score of each topic

within a pillar is equally weighted. The methodology of Bloomberg ESG disclosure score measures the amount of ESG data a company reports publicly; the score does not measure the company's performance on any data point.

Given that an ESG score is a multidimensional index built on the outputs of environmental, social, and governance disclosure scores, the impact of one dimension may offset the effects of another dimension within one single ESG score, so it is helpful to have separate data available. Thus, this paper considered the overall ESG score and the three separate pillar scores: Environment, Social, and Governance. The classification enabled the model to assess which dimension of the ESG disclosure as a whole is the key driver for company performance and which variable is most influential on company performance, with a comparison between Emerging and Developed markets. Table 2 shows the pillar scores and significant components.

Table 2. Pillar scores

<b>Pillar</b>	<b>Major Components</b>
Environmental	Climate Exposure, GHG Emissions Management, Water Management, Energy Management, Ecological Impact, Air Quality and Waste Management.
Social	Occupational Health & Safety Management, Labor & Employment Practices, Operational Risk Management, Community Rights & Relations and Ethics & Compliance.
Governance	Board Composition: Assess how well a board is positioned to provide diverse perspectives and proper oversight of management, as well as to assess potential risks in the current board structure.  Executive Compensation: Assess how well company pay policies and practices help align the interests of top executives with those of other stakeholders over the long term.

Source: Bloomberg (2023)

### 3.2.2 Dependent variables – Company Performance

In line with studies of Elsayed & Paton (2005), Alareeni & Hamdan (2020) and Mohammad & Wasiuzzaman (2021), this study uses the company's ROA to represent its financial performance and Tobin's Q to represent market sentiment as dependent variables to measure the company performance.

Tobin's Q was defined as a valuation method that divides the market value of a company by the replacement value of the company's assets. Since the replacement cost of total assets is difficult to estimate, another version of the formula often used is equity market value plus liabilities market value divided by equity book value plus the liabilities book value. If Tobin's Q is greater than 1, it implies that a company's stock is more expensive than the replacement costs of its assets which means that the stock is overvalued. Market believes the company will increase shareholder value in future. However, if the Tobin's Q is less than 1, the market anticipated the company to underperform in future (Wolfe & Sauaia, 2003). The natural logarithm of Tobin's Q was taken to address the non-normality of the residuals, consistent with the research conducted by Alareeni & Hamdan (2020).

ROA acts as a commonly used financial measure to evaluate company performance from an accounting perspective. ROA is an indicator of how profitable a company is relative to its total assets as the return of assets gives an idea to how efficient management is at using its assets to generate earnings. Bloomberg's definition of ROA equals to trailing 12-month net income divided by the average total assets (Bloomberg, 2023).

### **3.2.3 Control variables**

Three variables, company size, level of leverage, and capital intensity, were used as control variables to perform the analysis.

#### **3.2.3.1 Company size**

The company's total book value of assets was utilised as a measure of its size. (Lee, 2009; Ruan & Liu, 2021) provided evidence of a positive relationship between a company's profitability and its size. This positive relationship was explained by Alareeni & Hamdan (2020) and Ruan & Liu (2021), who suggested that larger companies encounter fewer risks, as potentially influencing company performance and valuation. Consequently, it is important to consider the impact of company size on performance. To address this, the natural logarithm of a company's total assets was used as a proxy for company size in this study.

#### **3.2.3.2 Financial leverage**

The concept of financial leverage, which represents the ratio of total debts to total equity, is a crucial factor strongly associated with company performance. Research by Ting et al. (2020) highlighted this relationship, while Raza (2013) uncovered evidence of a negative correlation between leverage levels and company performance. Raza's findings suggested that long-term

debt is more costly due to various direct and indirect expenses, leading to reduced profitability. Furthermore, Ibhagui & Olokoyo (2018) revealed that the adverse impact of leverage on company performance is particularly pronounced for smaller-sized companies and diminishes gradually as company size increases. Consequently, this study has chosen to include financial leverage as one of the control variables to manage the impact of leverage and financial risk on companies.

### 3.2.3.3 Capital intensity

To assess capital intensity, the study calculated the percentage of capital expenditure to sales based on the financial statements provided for this study. For various sectors such as industrial, banks, financials, insurance, utilities, REITs, and municipal sectors, the capital expenditure to sales ratio was determined by dividing capital expenditure by net sales (Bloomberg, 2023). A study by Li, Liao & Albitar (2020) investigated the impact of companies' environmental capital expenditures on company value. The study found that long-term institutional investors are inclined to invest in state-owned companies that make environmental capital expenditures in the Chinese A-share markets. Moreover, the research revealed that increased capital expenditure contributes to enhanced company value. Additionally, evidence from (Ruan & Liu, 2021) illustrated a positive correlation between capital expenditure and company performance. Therefore, in this study, the capital expenditure to sales ratio was utilised as a control variable. Table 3 below provides a summary of the variables utilised in the subsequent regressions.

Table 3. Regression Variables

<b>Variable name used in model</b>	<b>Measurements</b>
<b>Independent Variables</b>	
ESG (ESG Score)	Bloomberg ESG score includes all the disclosure of ENV, CSR, CG scores of companies (i), in period (t)
EVN (Environmental Score)	The EVN Bloomberg score measures the disclosure of energy use, waste, pollution and natural resource conservation of company (i), in period (t)
CSR (Social Score)	The CSR Bloomberg score measures disclosure of business relationship, employee' health and safety and community commitment of company (i), in period (t)
CG (Governance Score)	The CG Bloomberg score measures disclosure of corporate governance, board structure and compensation of company (i), in period (t)

<b>Dependent Variables</b>	
Tobin's Q	Tobin's Q equals to equity market value plus liabilities market value divided by equity book value plus the liabilities book value
ROA	ROA equals net income divided by average total assets (TA) of the company (i), in the period (t)
<b>Control Variables</b>	
Firm Size	Natural Logarithm of Total Assets of company (i), in period (t)
Financial leverage	Natural Logarithm of Debt to Equity ratio of company (i), in period (t)
Capital intensity	Natural Logarithm of Capital expenditure to sales ratio of company (i), in period (t)

### 3.3 Panel Data Statics Methodology

In order to explore the relationship between companies' ESG scores and corporate financial performance which measured using company ROA and Tobin's Q—the model use unbalanced panel data with information about public listed companies from emerging and developing markets to perform the panel regression models.

#### 3.3.1 Panel Data

Panel data refers to datasets that encompass both cross-sectional and time-series data (Wooldridge, 2002). This method offers the benefit of enhancing the precision in estimating the dependent variable through the utilisation of a broader range of data points and increased sample variance (Hsiao, 2007). Moreover, panel analysis accommodates individual-specific effects. Arellano (2003) further proposed that a drawback of several non-panel regression models is their failure to account for particular omitted variables, which could influence the independent variable by their correlation with the explanatory variables. Panel regression techniques aim to tackle this issue.

The dataset comprises data from various companies spanning the years 2015 to 2022 for this study. The unit of analysis is the company-year, meaning the data encompasses information on the variables of interest for each company for each year. If there is no missing data for a given company across the years covered by the data, the model includes one observation for each company in each year. However, if there is missing data for at least one variable of interest for a given company across the years, that company-year is excluded from the sample data to

complete the panel regression model. Due to the amount of missing information discussed and presented above, the sample data becomes an unbalanced panel dataset, meaning it does not have an equal number of company-years for each company in the cross-section. Generally, panel regression methods offer several different model options for analysis. Typically, this study chooses to test between Pooled Ordinary-Least Squares (OLS), Random Effects (RE), and Fixed-Effects (FE) models.

### **3.3.2 Pooled OLS Regression Model**

Pooled OLS models are a method that combines observations for each unit in the cross-section (companies in this study) across periods (years in this study) to estimate an OLS model, much like a conventional multiple regression model. However, it's important to note that this model does not account for the panel structure of the data with repeated observations for the companies across years, meaning it does not consider cross-sectional or time-series effects (Greene, 2008; Park, 2011). While Pooled OLS models are suitable when the data contains neither specific unit nor time effects, it's worth considering that this is often not the case for panel data. If individual effects are present, which is more common, using Random Effects (RE) or Fixed-Effects (FE) models to analyse the data may be more appropriate.

The distinction between fixed effects (FE) and random effects (RE) models lies in the conclusions drawn from the dataset. The FE model allows researchers to make conclusions about the specific group of companies within the dataset. In contrast, the RE model facilitates inferences about the broader population from which the sample was taken. Additionally, the FE model acknowledges the correlation between the individual effect (e.g., company-specific effects) of omitted variables and the independent variables. In contrast, the RE model operates under the assumption of no such correlation (Greene, 2008).

#### **3.3.2.1 Random Effects Model**

Random effects models offer a valuable method for analysing panel data. They consider unobserved unit-specific effects as random and uncorrelated with the explanatory variables in the model (Park, 2011). This approach enables drawing insightful conclusions about the entire population based on the sampled data.

#### **3.3.2.2 Fixed Effects Model**

The fixed-effects panel regression model effectively considers unobserved unit-specific effects as inherent characteristics of the units and incorporates them into the model. Additionally, this

model offers the advantage of controlling for unobserved, time-invariant heterogeneity among company units, thereby enhancing the validity of inferences regarding the correlation between the independent variable of interest and the dependent variable.

### 3.4 Model Diagnostic and Selection Testing

This section describes a series of diagnostic and model selection tests used to decide whether to use Pooled OLS, Random Effects, or Fixed Effects models for this study’s analysis and how to specify these models. These tests will evaluate and inform which model is most appropriate for drawing valid inferences from the datasets, allowing the analysis to answer the research question and test the hypotheses.

#### 3.4.1 Model Selection Tests

##### 3.4.1.1 Lagrange Multiplier Test

The study uses the Lagrange Multiplier test to compare the Pooled OLS model and the Random effects model. The null hypothesis of the test is that the variances of the unit effects are zero (Park, 2011). If this is not the case for a given dataset and model, the test will reject the null hypothesis and conclude that a Random effects model is more appropriate to model the data than a Pooled OLS model. Based on the test results in Table 4, all the models indicated a rejection of the null hypothesis at conventional levels of statistical significance ( $p < 0.05$ ). The result suggests that the random effects model is more suitable for data analysis than the pooled OLS model.

Table 4. Model selection tests

Model selection and diagnostic tests	Dependent variable	
	ROA log	Tobin’s Q log
Lagrange Multiplier Test (pooled OLS vs. random effects)	21,405***	38,668***
F-Test (fixed-effects vs. pooled OLS)	10.902***	29.735***
Hausman Test (random effects vs. fixed-effects)	182.38***	205.91***

\* Statistical significance  $< 0.10$ , \*\* Statistical significance  $< 0.05$ , \*\*\* Statistical significance  $< 0.01$ .

### **3.4.1.2 F-Test**

The second step is to compare the Pooled OLS model to the Fixed-effects model by conducting an F-test. For this test, the null hypothesis is the parameters for the unit fixed-effects are zero which indicates that there are no unit-specific effects in the data (Park, 2011). If unit-specific indicators have an impact, the test will reject this null hypothesis and conclude the study use the fixed-effects model specification to test the hypotheses. The results presented in the second row of Table 4 indicate the rejection of the null hypothesis at conventional levels of statistical significance for all models. Thus, the fixed-effects model is more appropriate for this research's data than the Pooled OLS model.

### **3.4.1.3 Hausman Test**

To determine the most suitable model for examining the data, the study will conduct an additional test to compare the Random-effects model and the Fixed-effects model. This will involve a Hausman test for all the models. The test's null hypothesis is that the regression errors of independent variables are not correlated with those of the unit-specific effects, suggesting that the Random-effects model is more appropriate than the Fixed-effects model. If this null hypothesis is rejected at conventional levels of statistical significance, it means that the model should use a Fixed-effects model instead of a Random-effects model. The results in row three of Table 4 indicate that the Fixed-effects model is more suitable for modelling the data. Therefore, the study will use Fixed-effects panel regression models for all the regression analysis to test the stated hypotheses in Chapter 2, focusing on the relationship between company ESG scores and company performance in developed and emerging markets from 2015 to 2022.

## **3.4.2 Model Diagnostics**

It is essential to conduct model diagnostic tests to verify that the data aligns with the pertinent assumptions of panel regression models. Deviations from these assumptions may result in flawed outcomes and incorrect conclusions drawn from hypothesis testing. This section examines the data for potential issues of multicollinearity, autocorrelation, heteroscedasticity, and normality of residuals.

### **3.4.2.1 Multicollinearity**

Multicollinearity occurs when the independent variables included in a model are correlated. This can cause the true impact of independent variables on the dependent variables not to be appropriately reflected by the results of the regression models (Wooldridge, 2002). In extreme

cases, it can make model results misleading both in terms of the signs of estimated coefficients and their statistical significance. To examine the predictor variables for multi-collinearity, the study will examine the correlation matrix of Pearson correlation coefficients (see Table 8 and Table 9 in Chapter 4). The study conducts the test for the sample of companies from both emerging and developing markets. Based on these matrices, all correlation coefficients were below 0.85 (Schroeder, Lander & Levine-Silverman, 1990). Thus, multi-collinearity is unlikely to cause challenges for the validity of the panel regression results.

### 3.4.2.2 Autocorrelation

The Breusch-Godfrey/Wooldridge test was used to investigate the effect of serial correlation (auto-correlation) in the panel regression models for the ESG score's impact on corporate financial performance (Breusch, 1978; Godfrey, 1978; Wooldridge, 2002). The null hypothesis of this test is that there is no serial correlation. Based on Table 5, all fixed-effects models for both dependent variables were found to reject the null hypothesis at conventional levels of statistical significance. This implies that auto-correlation may have some impact on the model results. To address the potential challenges stemming from serial correlation in the data, the study used robust standard errors in the panel regression models (Hoechle, 2007; Torres-Reyna, 2007). It is important to emphasise that while autocorrelation may affect the statistical inferences, the estimations themselves remain unbiased (Breusch, 1978; Godfrey, 1978; Wooldridge, 2002).

Table 5. Model diagnostic tests

Model selection and diagnostic tests	Dependent variable	
	ROA log	Tobin's Q log
Breusch-Godfrey Test (auto-correlation)	209.86***	1231.5***
Breusch-Pagan Test (heteroscedasticity)	63.962***	1,369.4***
Kolmogorov-Smirnov (normality of residuals)	0.21441***	0.31839***

\* Statistical significance < 0.10, \*\* Statistical significance < 0.05, \*\*\* Statistical significance < 0.01.

### 3.4.2.3 Heteroscedasticity

The Breusch-Pagan test was employed to examine potential heteroscedasticity in the fixed-effects models. The null hypothesis of this test assumes homoscedasticity, indicating a

consistent variance of the error terms (Torres-Reyna, 2007). The test outcomes are presented in Table 5. All models reject the null hypothesis, indicating that heteroscedasticity is challenging across all models. To mitigate this concern, the model will employ robust standard errors for hypothesis testing in the panel regression models (Hoechle, 2007; Torres-Reyna, 2007), similar to the solution to address the issue for autocorrelation.

#### **3.4.2.4 Normality of residuals**

One of the major regression assumptions is the normality of the residuals in the models. This can be tested through various statistical tests, one of the best known of which is the Kolmogorov-Smirnov test (Lilliefors, 1967). Since the study consists of a relatively large sample size (larger than 5,000 observations), the study uses the Kolmogorov-Smirnov test instead of alternatives defined for smaller samples, such as the Shapiro-Wilk test. The null hypothesis of this test is that the residuals are normally distributed. All of the fixed-effects models show non-normality of residuals, although all variables except ESG scores are used in the form of their natural logarithms. This implies that the models' residuals are not normally distributed (see Table 4). The study will consider this potential concern when discussing the analysis's limitations and outlining areas for future research.

When interpreting results derived from data represented in natural logarithms, it is crucial to recognise that a one-unit change in the independent variable corresponds to a one percent change in the dependent variable, rather than a one-unit absolute change.

### **3.5 Regression Procedure and Regression Models**

The regression model uses two dependent variables to test our hypotheses. The first dependent variable is ROA. The second dependent variable is Tobin's Q. The regression models measure each outcome variable once a year for each company in the dataset for 2015 to 2022. In the descriptive and inferential analysis, the models use the natural logarithm of both variables because both variables show a substantial skewness and several outliers in the sample data. Taking the natural logarithm will improve the dataset and allow it to meet important regression assumptions, such as the normal distribution of residuals, more efficiently.

The main independent variables are the company's ESG scores and the individual components Environmental scores, Social scores, and Governance scores. Since the ESG scores and the components are not heavily skewed and show few outliers in the raw data, the regression models use company ESG scores without taking natural logarithms.

In terms of the control variables listed at the beginning of the chapter, namely company size, leverage, and Capex, the regression models also use the natural logarithm due to the skewed distribution of these variables in the raw data and the presence of a large number of outliers.

Initially, the model design aimed to compare the ESG score's impact on corporate financial performance between emerging markets and developed markets by using a market indicator variable and interacting it with the main independent variable of interest, which is the ESG score. However, such model design is not feasible in the study since the model selection tests reported above indicate fixed-effects panel regression models as the most suitable. Unfortunately, fixed-effects models do not allow for the inclusion of time-invariant company characteristics, such as the market type to which they belong. To explore the relationship between ESG scores and company performance in emerging and developed markets, the regression analysis divides the sample into these two market categories. Each regression model is then run separately for emerging and developed market companies, allowing for a comparison of their associations with company performance.

As discussed above, the model selection tests suggest using fixed-effects panel regression models instead of pooled OLS models or random effects models. Thus, the study uses fixed-effects panel regression models with company fixed effects throughout the research analysis. The model uses robust standard errors (known as sandwich estimators of variance) to test hypotheses about regression coefficients to address potential challenges related to auto-correlation and heteroscedasticity discussed above.

The following two equations present the reduced form expression of the two fixed-effects panel regression models estimate for the two dependent variables, ROA log and Tobin's Q log:

$$\text{LogROA}_{it} = \beta_1 \text{ESG}_{it} + \beta_2 \text{LogFirm Size}_{it} + \beta_3 \text{LogLeverage}_{it} + \beta_4 \text{LogCapex}_{it} + \alpha_i + \mu_{it} \quad (1)$$

$$\text{LogTQ}_{it} = \beta_1 \text{ESG}_{it} + \beta_2 \text{LogFirm Size}_{it} + \beta_3 \text{LogLeverage}_{it} + \beta_4 \text{LogCapex}_{it} + \alpha_i + \mu_{it} \quad (2)$$

**Where:**

- $\text{LogROA}_{it}$  = Natural logarithm of Return on Asset for company i in time period t

- $LogTQ_{it}$  = Natural logarithm of Tobin's Q ratio for company i in time period t
- $ESG_{it}$  = ESG score for company i in time period t
- $LogFirm\ Size_{it}$  = Natural logarithm of firm size for company i in time period t
- $LogLeverage_{it}$  = Natural logarithm of Leverage for company i in time period t
- $LogCapex_{it}$  = Natural logarithm of Capex for company i in time period t
- $\alpha_i$  = Entity-specific fixed effect that accounts for unobserved heterogeneity across entities
- $\mu_{it}$  = Random error term that varies across both entities and time, capturing the random noise in the model

## CHAPTER 4: FINDINGS AND ANALYSIS

This chapter explores the results of descriptive and inferential statistical analyses that look at the relationship between corporate financial performance (measured by ROA and Tobin's Q) and ESG scores. First, the study will summarise the descriptive findings. Next, the study will introduce the initial bivariate statistical tests, specifically the difference-in-means tests. Finally, the study will highlight the results obtained from our fixed-effects panel regression models.

### 4.1 Descriptive Statistics

The section starts the descriptive analysis by examining the summary for all variables included in the models. The study distinguishes between the sample of emerging market companies and developed market companies to conduct a comparative analysis of companies operating in different economic markets (see Table 6 and Table 7).

Both the ROA and Tobin's Q, which measured corporate financial performance, showed similar trends in both market company samples. However, the mean and median of log ROA were slightly higher for developed market companies compared to emerging market companies. The means, medians, standard deviations, and variances were all close, indicating that both dependent variables were similarly distributed around their means in both market company samples. Additionally, other summary statistics reported in Table 6 and Table 7 below were similar for both market company samples.

The main independent variable is the ESG scores, which measure the company's overall ESG performance and three underlying components (i.e. E, S, and G scores). The summary of statistics indicates that developed market companies consistently have higher means and medians across all four independent variables. This suggests that companies operating in developed markets generally exhibit higher levels of ESG relevant financial performance. This finding is consistent with the study by Alareeni & Hamdan (2020). As for other summary statistics, including measures of spread such as standard deviation and variance, developed and emerging market companies are closely aligned and/or exhibit similar trends.

Table 6. Summary statistics of ESG scores and Corporate Financial Performance (CFP) of Emerging market companies

	ESG	E	S	G	Log ROA	Log Tobin's Q	Log Leverage	Log Firm Size	Log Capex
Mean	42.85	27.17	25.93	75.31	1.38	0.54	3.65	11.25	1.57
Median	42.40	25.37	23.91	75.59	1.52	0.33	4.02	10.89	1.64
Std. Dev.	12.90	21.70	14.16	10.92	1.10	0.65	1.72	2.24	1.27
Variance	166.41	471.01	200.50	119.34	1.21	0.43	2.94	5.01	1.63
Kurtosis	2.40	2.12	2.96	6.93	4.42	4.21	7.75	4.49	4.41
Skewness	0.23	0.38	0.67	-1.19	-0.76	1.23	-1.65	1.01	-0.51
Range	82.09	91.78	78.42	99.31	10.74	4.99	18.14	15.60	15.01
Min.	0.00	0.00	0.00	0.00	-6.17	-1.00	-9.21	5.81	-6.91
Max.	82.09	91.78	78.42	99.31	4.58	3.99	8.93	21.41	8.10
Count	11,971	11,971	11,971	11,971	11,971	11,971	11,971	11,971	11,971

Table 7. Summary statistics of ESG scores and Corporate Financial Performance (CFP) of Developed market companies

	ESG	E	S	G	Log ROA	Log Tobin's Q	Log Leverage	Log Firm Size	Log Capex
Mean	49.45	35.12	30.79	82.34	1.43	0.55	3.99	9.62	1.50
Median	50.75	36.60	29.99	84.98	1.58	0.42	4.13	9.50	1.45
Std. Dev.	13.28	21.20	14.32	12.98	1.05	0.59	1.44	1.59	1.39
Variance	176.22	449.46	205.03	168.38	1.10	0.35	2.07	2.53	1.94
Kurtosis	2.56	2.12	2.49	7.03	4.76	4.46	10.93	3.33	4.62
Skewness	-0.25	-0.06	0.25	-1.81	-0.90	1.08	-1.72	0.38	-0.10
Range	83.26	92.30	83.83	100.00	11.42	5.04	19.19	11.39	13.52
Min.	3.02	0.00	0.00	0.00	-5.95	-0.89	-8.52	3.54	-6.64
Max.	86.28	92.30	83.33	100.00	5.47	4.16	10.67	14.93	6.88
Count	10,472	10,472	10,742	10,472	10,742	10,472	10,742	10,472	10,472

In analysing the three control variables, it is observed that Log Leverage exhibited higher mean and median values in developed companies as opposed to emerging market companies. Conversely, emerging market companies demonstrated a larger average of Log Company size and Log Capex values in comparison to developed market companies, as evidenced by their higher mean and median values.

Figure 1 illustrates the distribution of ESG scores for the entire sample, disregarding the distinction between emerging market and developed market companies. The plot reveals that the majority of company-years in the overall sample data have ESG scores between 25 and 75. Only a minority of companies in a few years have ESG scores lower than 25 or higher than 75. Additionally, Figure 1 presents an approximately bi-modal distribution. The sample distribution indicates one cluster of company-years with ESG scores around 30 and another, larger cluster with scores around 60. This suggests that there might be two types of companies in terms of ESG scores in the overall sample data.

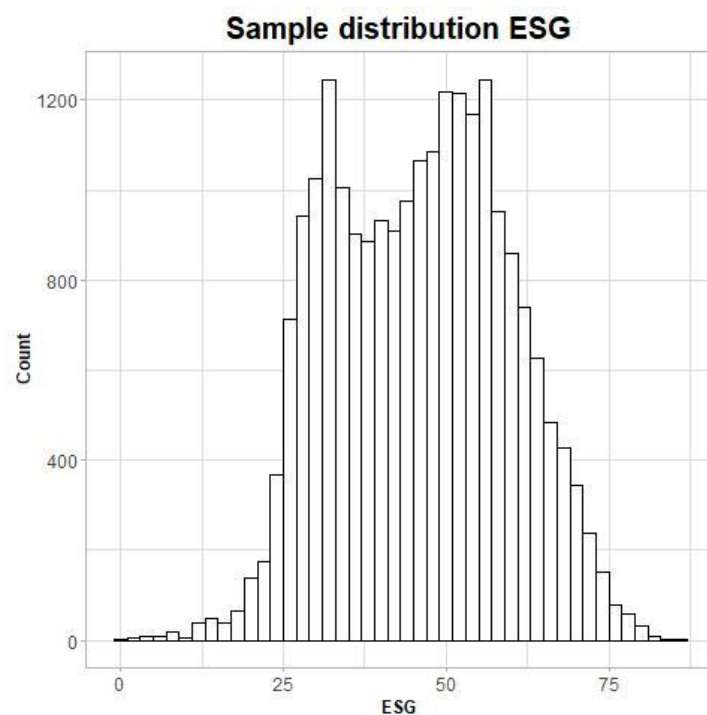


Figure 1: Distribution of ESG scores of the entire sample

Moreover, a closer examination of the ESG score distributions reveals that emerging market companies display a clearer resemblance to a bi-modal distribution. Specifically, within the blue bars, there is a distinct subgroup with lower ESG scores around 30, juxtaposed with a

larger group centred just above 50. While there is also a minor concentration of developed market companies with lower scores, it is less pronounced compared to the bi-modality observed among emerging market companies. Hence, the predominant bi-modal distribution appears to be primarily attributed to emerging market companies, as suggested by the analysis of Figure 1.

Figure 2 confirms the bi-modal distribution of ESG scores across the entire dataset. It confirms that, on average, developed market companies have superior ESG performance. Both distributions have similar spreads, which is consistent with the comparable standard deviations and variances detailed in Table 6 and Table 7.

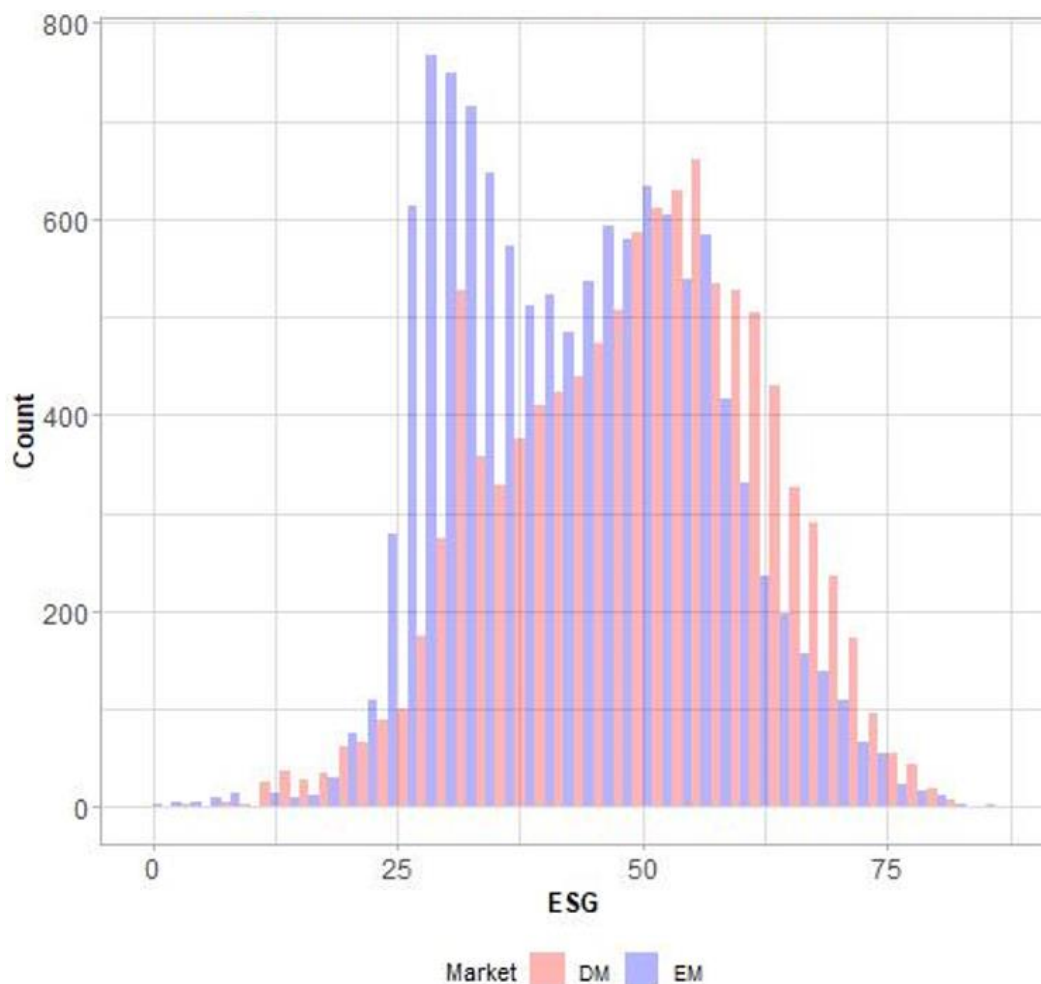


Figure 2: Distribution of ESG scores for developed and emerging market companies

Figure 3 illustrates the mean annual ESG scores for both developed and emerging market companies from 2015 to 2022. The graph depicts a consistent and significant increase in annual averages for both types of companies from 2015 to 2022. These findings align with previous studies by Jiao (2011) and Grewal, Riedl & Serafeim (2018), indicating that global companies are placing greater emphasis on ESG performance and disclosure. It's worth noting that throughout this period, the average ESG scores of developed market companies consistently exceed those of emerging market companies, reinforcing the observations in Figure 1 and 2. These results are in line with the study by Mohammad & Wasiuzzaman (2021), which emphasised the lower ESG adoption in emerging markets.

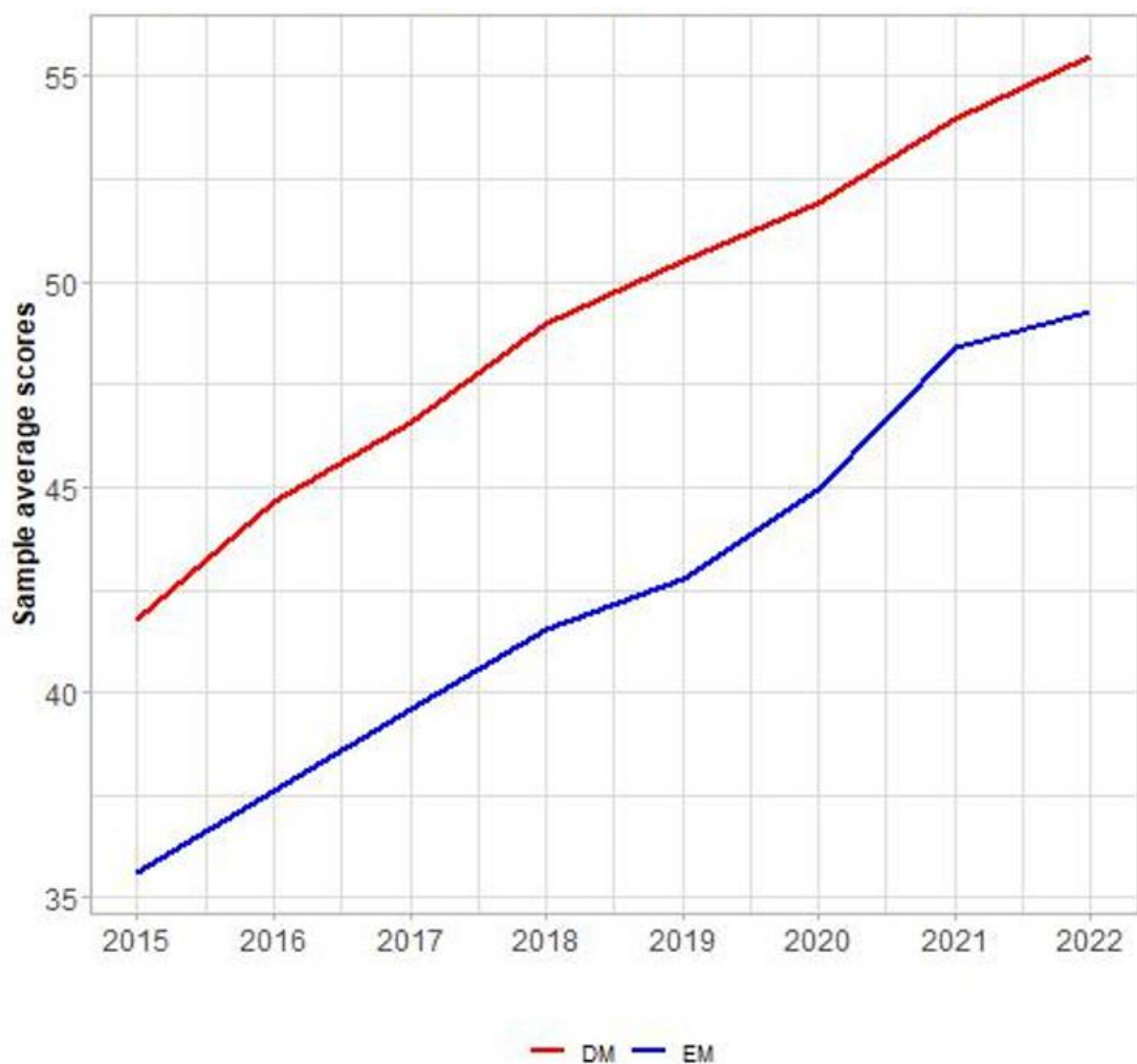


Figure 3: Mean of annual ESG scores for both developed and emerging market companies (2015 to 2022)

In order to gain insight into the ESG score, it's important to analyse how the E, S, and G components are distributed in both emerging and developed markets. As shown in Figure 4, there is a bi-modal distribution of environmental scores in emerging markets. It is clear that many companies have environmental scores between 0 and 35, with fewer companies achieving scores over 50. Conversely, the distribution in developed markets, shows a higher concentration of environmental scores falling between 30 and 75 compared to emerging markets. This suggests that environmental performance in emerging markets is still in its early stage and generally lags behind that of developed markets. These findings are consistent with the BCG research conducted by Tansan et al. (2023).

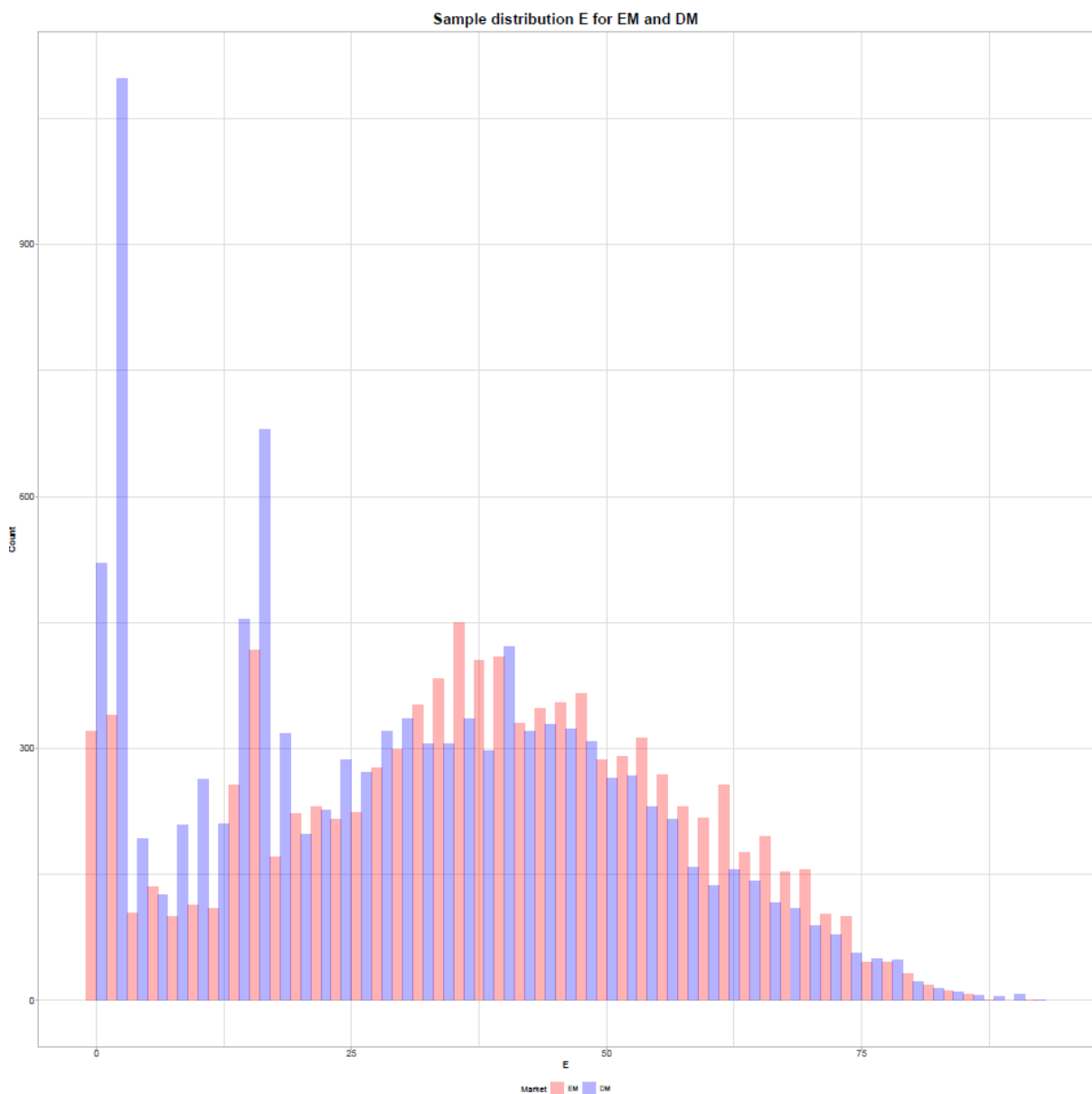


Figure 4: Distribution of Environmental scores for developed and emerging market companies

In Figure 5, the social scores for both emerging market companies and developed market companies are mostly on the lower end. There are more companies with social scores between 10 to 40, and fewer companies received scores above 60. However, emerging market companies generally have lower scores between 0 to 20 compared to developed market companies.

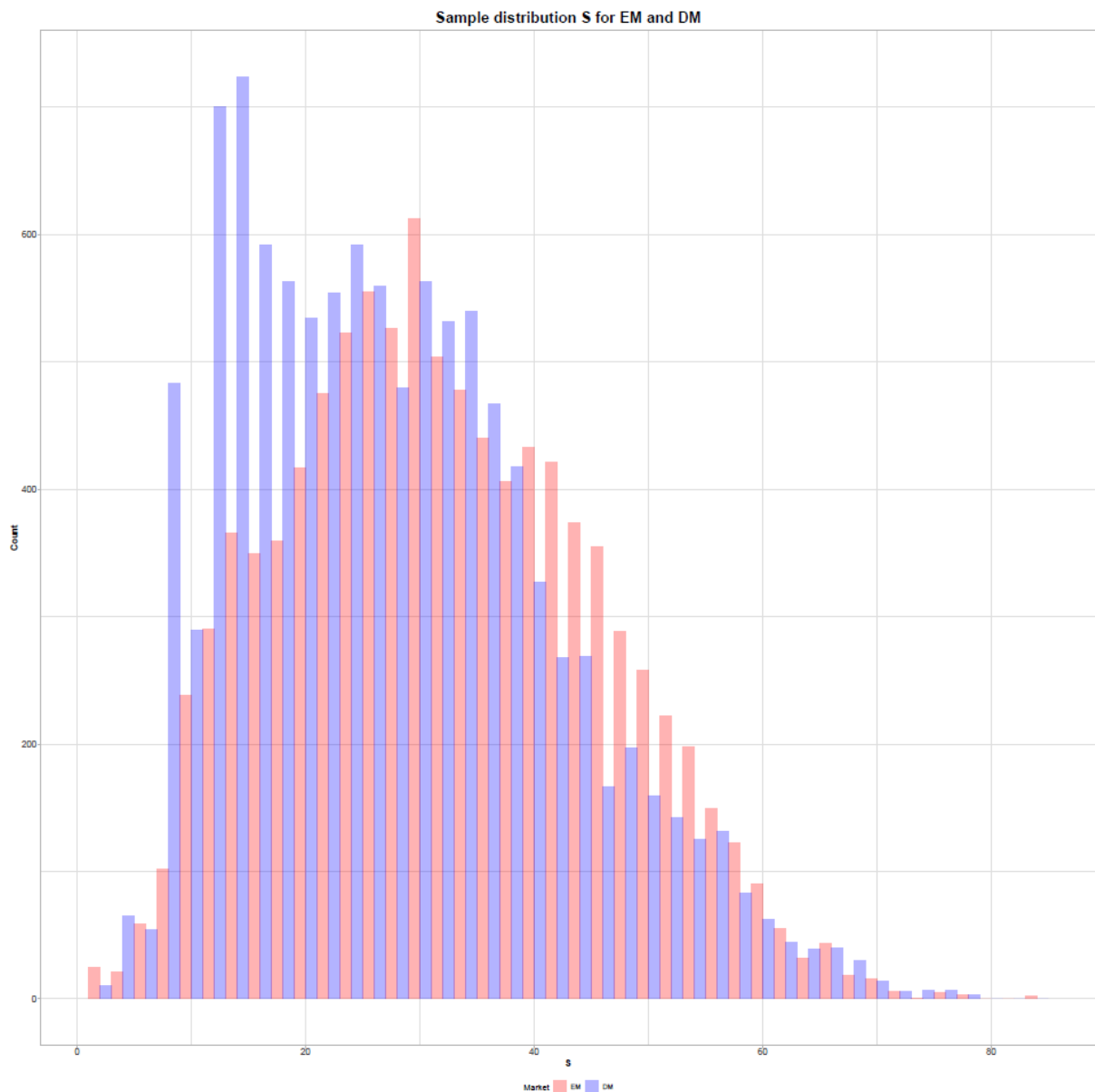


Figure 5: Distribution of Social scores for developed and emerging market companies

The governance score in Figure 6 below shows that most emerging market companies have governance scores between 60 and 85, while a larger proportion of developed market companies scored between 80 and 100. Relatively few companies have scores below 50.

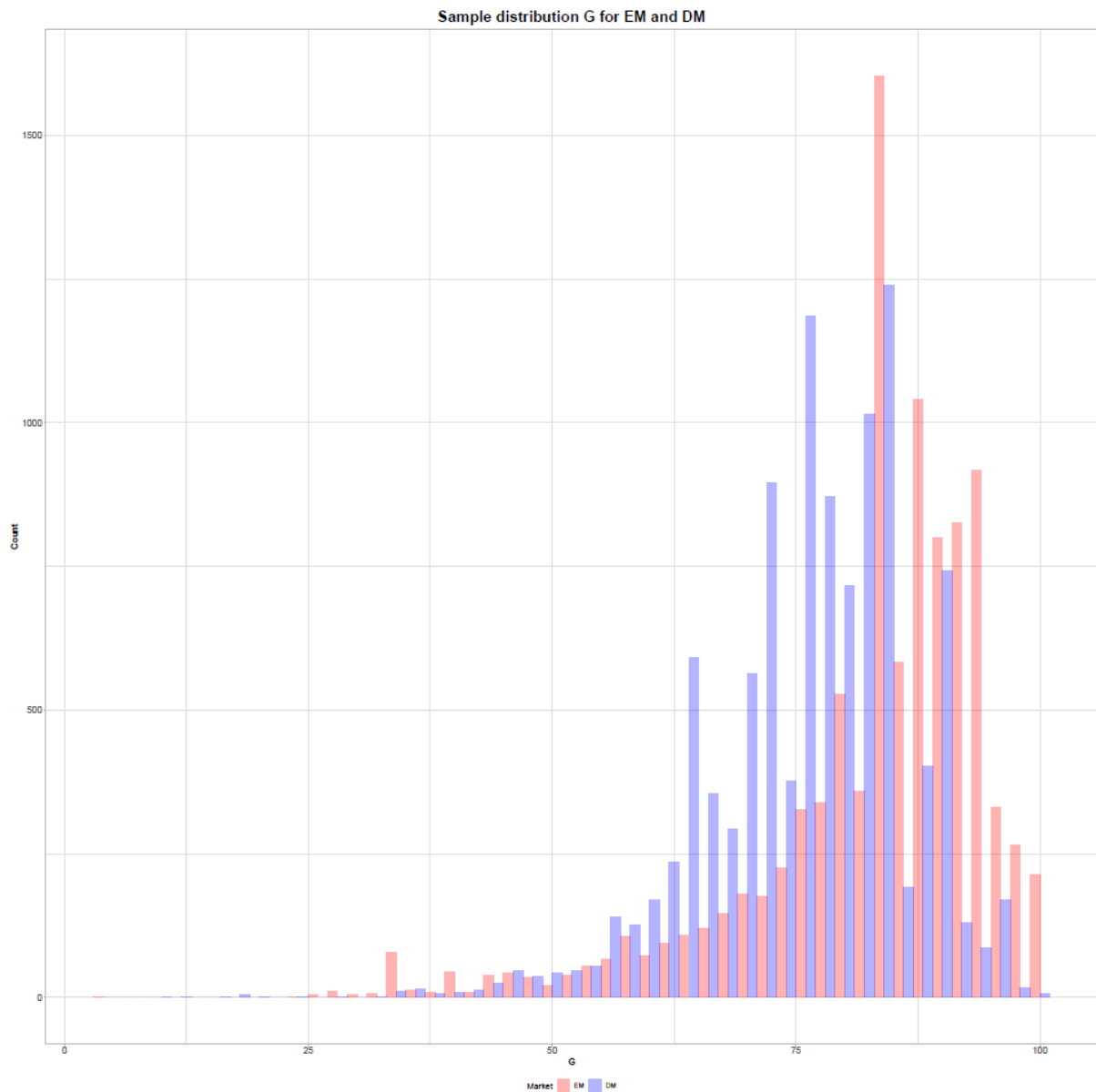


Figure 6: Distribution of Governance scores for developed and emerging market companies

The initial findings from the analysis of individual variables show that most of the variables studied, such as the two dependent variables ROA and Tobin's Q, exhibit significant similarities between developed market and emerging market companies. However, there are notable differences in the primary independent variable, ESG scores. Specifically, developed market companies consistently show higher average ESG and ESG component measure scores than emerging market companies across the entire sample and over different years. This finding requires further investigation and scrutiny which is detailed in the inferential analysis phase of the study.

## 4.2 Correlation Metrics and Difference-in-Means Tests

Correlation analysis is a powerful tool that enables researchers to gain preliminary insights into the relationships among variables in their analysis. Utilising robust methods like the Pearson Correlation Matrix can provide valuable insights into the strength and direction of linear relationships between variables. This analysis allows researchers to pinpoint potential correlations among the variables. Subsequent sections will delve into the correlation results and the statistical significance of the observed differences in the variables between emerging and developed market companies, as revealed by the descriptive analysis conducted thus far.

Tables 8 and Table 9 show correlation matrices for emerging market companies and developed market companies, respectively, displaying Pearson correlation coefficients. These coefficients range from -1 to 1, indicating perfect negative and positive correlations, with values close to 0 suggesting low correlation between variables. The analysis indicates limited substantial correlations among variables, except for correlations involving ESG scores and their underlying components (E, S, and G scores), as well as correlations between two measures of company performance (Log ROA and Log Tobin's Q). This is an important insight regarding potential multi-collinearity problems for the regression models because the independent variables are not strongly correlated. However, it also suggests few strong bivariate correlations between dependent variables and predictors.

For developed market companies, ESG scores and their components show negative and relatively weak associations with corporate financial performance (ROA log) and market valuation (Tobin's Q log), implying that higher ESG scores correspond to weaker company financial performance and market valuation. Similar trends are observed for emerging market companies, although a particularly positive but weak association exists between Environmental score (E) and ROA log.

In summary, none of the independent variables show a strong correlation at the basic level with the two dependent variables. It is worth noting that ESG and most of its components—E, S, and G—have a negative basic-level correlation with the two measures of corporate performance for emerging market companies and developed market companies. However, both correlations are relatively weak. The regression analysis that follows will further explore the correlation between the independent and dependent variables.

The analysis found an interesting observation regarding the relationship between control variables and corporate financial performance in both developed and emerging markets. Firstly, it was observed that leverage has a strong negative relationship with both ROA and Tobin's Q in both markets, with the negative association being stronger in emerging markets. This indicates that companies in emerging markets with higher debt tend to have lower financial performance. Secondly, company size also showed a solid negative relationship with ROA and Tobin's Q in both markets, suggesting that smaller companies generally outperform larger companies. Lastly, the study found that there is a positive relationship between capex and company financial performance (ROA) as well as market valuation of assets (Tobin's Q) in emerging markets, implying that higher capital intensity leads to better financial performance. This is in line with conventional theory as referred to by Ruan & Liu (2021).

Table 8. Pearson Correlation Matrix for Companies in Emerging Markets

*The table illustrates the correlation coefficients companies listed in emerging economies*

	ESG	E	S	G	Log ROA	Log Tobin's Q	Log Leverage	Log Company Size	Log Capex
ESG	1.00								
E	0.93	1.00							
S	0.88	0.76	1.00						
G	0.57	0.31	0.30	1.00					
Log ROA	-0.02	0.03	-0.04	-0.08	1.00				
Log Tobin's Q	-0.16	-0.14	-0.16	-0.08	0.58	1.00			
Log Leverage	0.11	0.08	0.13	0.06	-0.47	-0.46	1.00		
Log Company Size	0.31	0.22	0.33	0.25	-0.37	-0.41	0.32	1.00	
Log Capex	0.01	0.04	-0.04	-0.01	0.14	0.13	-0.05	-0.18	1.00

Table 9. Pearson Correlation Matrix for Companies in Developed Markets

*The table illustrates the correlation coefficients companies listed in developed economies*

	ESG	E	S	G	Log ROA	Log Tobin's Q	Log Leverage	Log Company Size	Log Capex
ESG	1.00								
E	0.90	1.00							
S	0.87	0.74	1.00						
G	0.63	0.33	0.36	1.00					
Log ROA	-0.02	-0.01	-0.07	0.03	1.00				
Log Tobin's Q	-0.12	-0.12	-0.16	0.01	0.63	1.00			
Log Leverage	0.15	0.11	0.10	0.15	-0.24	-0.15	1.00		
Log Company Size	0.39	0.30	0.30	0.35	-0.47	-0.46	0.34	1.00	
Log Capex	0.08	0.15	0.08	-0.07	-0.03	-0.08	0.12	-0.03	1.00

Table 10 provides a more detailed analysis and introduces the first element of inferential statistics by displaying the results of difference-in-means tests. Each row in the table represents the outcome of a difference-in-means test that evaluates whether the average for the variable in the row is statistically different between emerging and developed market companies. If the test statistic is large (t-statistic result is above 1.96 based on the sample size) or the p-value is small (below 0.05 for conventional levels of statistical significance), then the distinction between emerging and developed market companies is noticeable, meaning it is statistically significant at conventional levels.

In the difference-in-means tests, it was found that developed market companies generally have higher average values on most variables, except for company size and capex. Emerging market companies, on the other hand, have higher average values for company size and capex. These differences are statistically significant, except for the difference in Tobin's Q. Although there is an observed difference in the average scores of emerging markets and developed market companies for Tobin's Q, it is too small to be distinguished from zero given the large sample size. Despite the descriptive similarities between emerging and developed market companies in terms of most descriptive statistics and the overall weak bivariate correlations between most variables in the sample, the large sample size makes most of these minor differences statistically significant at conventional levels. Therefore, in the regression analysis the study expected that most predictors will have minor but statistically significant effects on both dependent variables for both emerging market companies and developed market companies.

Table 10. Difference-in-means tests emerging and developed market companies

Variables	Emerging	Developed	t-statistic	p-value
ESG	42.85	49.45	37.77	0.00*
E	27.17	35.12	27.66	0.00*
S	25.93	30.79	25.46	0.00*
G	75.31	82.34	44.06	0.00*
ROA	1.36	1.43	6.47	0.00*
Tobin's Q	0.54	0.55	1.47	0.04*
Leverage	3.65	3.99	15.82	0.00*
Company size	11.25	9.62	-61.95	0.00*
Capex	1.57	1.5	-3.68	0.00*

Note: \* indicates that the difference between emerging and developed markets is significantly different from zero at the 5% level.

### 4.3 Regression Results

This study followed the methodology outlined in Chapter 3 to investigate the connection between ESG performance and company financial performance in developed and emerging markets. The following sections provide a detailed analysis and discussion of the regression findings concerning the relationship between ESG scores and company financial performance.

Previous research by McWilliams & Siegel (2001), Agle et al. (2008), Eberle, Berens & Li (2013) and Fatemi, Glaum & Kaiser (2018) has generated growing interest in the ESG performance of companies and has highlighted the positive impact on company financial performance associated with higher ESG scores (Orlitzky, Schmidt & Rynes, 2003; Eccles, Ioannou & Serafeim, 2014). Chapter 3 outlined the Fixed Effects Model as the most suitable model for statistically examining the relationship between ESG scores and company financial performance in both developed and emerging market datasets.

The baseline regression model in Table 11 presents the initial results for the fixed-effects panel regression models. The first two columns in Table 11 display models estimated based on the sample of emerging market companies. The third and fourth columns present the same models but are estimated using data from developed market companies. Numbers in brackets represent two-tailed t-statistics.

Concerning the primary independent variable of interest, for emerging market companies, the ESG score showed a negative correlation with the dependent variable ROA (Return on Assets) and a positive correlation with Tobin's Q log. However, only the latter is statistically significant at conventional levels. Therefore, as the ESG score of an emerging market company increases, our model predicts an increase in Tobin's Q log as well, all else being equal, which aligns with the findings of Mohammad & Wasiuzzaman (2021). As the regression models used fixed-effects models, this finding accounts for unobserved time-invariant confounders at the company level.

Table 11. Fixed-effects panel regression model without clustered standard errors on ESG

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
ESG	-0.000 (0.001)	0.003*** (0.000)	0.007*** (0.001)	0.004*** (0.000)
Log firm size	0.037* (0.021)	-0.171*** (0.009)	-0.233*** (0.022)	-0.082*** (0.008)
Log leverage	-0.140*** (0.009)	-0.040*** (0.004)	-0.095*** (0.009)	-0.008** (0.003)
Log capex	-0.062*** (0.011)	0.020*** (0.005)	-0.072*** (0.012)	0.010** (0.004)
R <sup>2</sup>	0.028	0.063	0.035	0.017
Adj. R <sup>2</sup>	-0.152	-0.111	-0.134	-0.155
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

For companies in developed markets, the results in columns three and four of Table 11 show that there are positive and statistically significant relationships between the company's financial and market value performance and ESG scores. Increases in ESG scores are associated with increases in both company financial performance measures and company valuation. These findings are consistent with the empirical evidence from Alareeni & Hamdan (2020) and (Eccles, Ioannou & Serafeim, 2014; Ting et al., 2020). The effects for developed market companies are also substantially larger than the estimated ESG coefficients for emerging market companies, suggesting a stronger impact of ESG scores on company performance. The observation of the difference in the strength of the relationship between these variables for emerging and developed markets aligns with findings by Ting et al. (2020).

Regarding the control variables, log leverage is consistently negatively associated with both ROA and Tobin's Q of both emerging market and developed market companies. The association is distinguishable from zero in all models. Company size is mostly negatively and statistically significantly related to the dependent variables for both emerging and developed market companies, except ROA of emerging market companies with no correlation. Furthermore, capex has a positive and statistically significant coefficient in the model for Tobin's Q of both emerging and developed market companies, which implies that the more capital investment in the company greater the market valuation sentiment of the company. In contrast, log capex expressed a negative and significant relationship with ROA for both

emerging and developed market companies over the period. The findings of various associations between dependent variables and control variables contributed to the existing research as there are limited findings on such topics (Alareeni & Hamdan, 2020; Mohammad & Wasiuzzaman, 2021; Ruan & Liu, 2021).

Tables 12 to 14 represent the companies' environmental, social, and corporate governance performance as independent variables. Overall, the results for the aggregated ESG score are similar to those presented in Table 11.

In Table 12 the study reports a positive and statistically significant relationship between the companies' environmental score (E) and financial performance. For emerging market companies, this holds for the dependent variable Tobin's Q, which is in line with findings by Bahadori, Kaymak & Seraj (2021). However, the environmental score had no significant relationship with log ROA in emerging markets. For developed market companies, a positive correlation between the company's financial performance and its environmental score is observed; this is in line with findings by Dowell, Hart & Yeung (2000) and Moneva & Ortas (2010) for companies in developed markets.

Similar results are obtained for the companies' social score (S) as outlined in Table 13. The study observes a strong positive correlation between Social scores and log ROA and Tobin's Q in developed markets, which is consistent with the findings of Lev, Petrovits & Radhakrishnan (2010), Taneja, Taneja & Gupta (2011), Barnett & Salomo (2012) and Dhaliwal et al., (2014). In the emerging market, there is a positive association between social scores and Tobin's Q, but no correlation between ROA and social scores.

Table 12. Fixed-effects panel regression models without clustered standard errors on Environmental Score

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
E	-0.000 (0.001)	0.001*** (0.000)	0.004*** (0.001)	0.002*** (0.000)
Log firm size	0.038* (0.020)	-0.164*** (0.008)	-0.211*** (0.021)	-0.070*** (0.008)
Log leverage	-0.140*** (0.009)	-0.041*** (0.004)	-0.095*** (0.009)	-0.008*** (0.003)
log capex	-0.062*** (0.011)	0.019*** (0.005)	-0.072*** (0.012)	0.009** (0.004)
R <sup>2</sup>	0.028	0.063	0.033	0.013
Adj. R <sup>2</sup>	-0.152	-0.112	-0.136	-0.159
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

Table 13. Fixed-effects panel regression models without clustered standard errors on Social Score

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
S	0.000 (0.001)	0.003*** (0.000)	0.006*** (0.001)	0.003*** (0.000)
Log firm size	0.032* (0.019)	-0.169*** (0.008)	-0.217*** (0.021)	-0.068*** (0.008)
Log leverage	-0.140*** (0.009)	-0.040*** (0.004)	-0.093*** (0.009)	-0.008*** (0.003)
Log capex	-0.062*** (0.011)	0.020*** (0.005)	-0.072*** (0.012)	0.009** (0.004)
R <sup>2</sup>	0.028	0.065	0.034	0.012
Adj. R <sup>2</sup>	-0.152	-0.109	-0.134	-0.160
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

Focusing the governance scores as the main independent variable (G) in Table 14, the positive and statistically significant impact on Tobin's Q disappears for emerging market companies, which support the conclusion drawn by Bahadori, Kaymak & Seraj (2021). However, the statistically significant positive impact continues to exist for both ROA and Tobin's Q for developed market companies, supporting the findings by Gompers, Ishii & Metrick (2003), Chung & Zhang (2011) and Giround & Mueller (2011), and better corporate governance

produce higher company value and profits. As before in Table 4.5, majority of the statistical significances are strong at 5% and 1% levels.

Table 14. Fixed-effects panel regression models without clustered standard errors on Governance Score

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
G	-0.001 (0.001)	0.000 (0.001)	0.004*** (0.001)	0.003*** (0.000)
Log firm size	0.040** (0.018)	-0.140*** (0.007)	-0.177*** (0.020)	-0.056*** (0.008)
Log leverage	-0.141*** (0.009)	-0.042*** (0.004)	-0.094*** (0.009)	-0.008** (0.003)
Log capex	-0.063*** (0.011)	0.018*** (0.005)	-0.075*** (0.012)	0.008* (0.004)
R <sup>2</sup>	0.028	0.060	0.030	0.011
Adj. R <sup>2</sup>	-0.152	-0.115	-0.139	-0.162
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

Tables 15 to 18 re-estimate the models found in Tables 11 to 14, but this time using standard errors clustered by company instead of the usual standard errors. This approach helps to address potential issues related to heteroscedasticity and auto-correlation that the study identified during our model diagnostic tests. In general, the study found that the clustered standard errors are slightly larger than the conventional ones, indicating that the conventional standard errors may be underestimated. However, when the study used the more appropriate standard errors, the main results from Table 11 to Table 14 remained unchanged. Specifically, the study found that ESG has a statistically significant impact on Tobin's Q for both emerging market companies and developed market companies, and the study also observed a significant relationship between ESG and ROA for developed market companies. Our analysis of the E, S, and G scores also yielded consistent results despite using a stricter method for conducting hypothesis tests. This suggests that the results discussed earlier are robust and not significantly affected by potential issues related to heteroscedasticity and auto-correlation.

Table 15. Fixed-effects panel regression models with standard errors clustered by company on ESG Score

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
ESG	-0.000 (0.002)	0.003*** (0.001)	0.007*** (0.001)	0.004*** (0.001)
Log firm size	0.037 (0.036)	-0.171*** (0.017)	-0.233*** (0.039)	-0.082*** (0.022)
Log leverage	-0.140*** (0.016)	-0.040*** (0.007)	-0.095*** (0.013)	-0.008 (0.007)
Log capex	-0.062*** (0.015)	0.020*** (0.007)	-0.072*** (0.016)	0.010 (0.007)
R <sup>2</sup>	0.028	0.063	0.035	0.017
Adj. R <sup>2</sup>	-0.152	-0.111	-0.134	-0.155
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 16. Fixed-effects panel regression models with standard errors clustered by company on Environmental Score

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
E	-0.000 (0.001)	0.001*** (0.000)	0.004*** (0.001)	0.002*** (0.000)
Log firm size	0.038 (0.034)	-0.164*** (0.017)	-0.211*** (0.039)	-0.070*** (0.021)
Log leverage	-0.140*** (0.016)	-0.041*** (0.007)	-0.095*** (0.013)	-0.008 (0.007)
Log capex	-0.062*** (0.015)	0.019*** (0.007)	-0.072*** (0.016)	0.009 (0.007)
R <sup>2</sup>	0.028	0.063	0.033	0.013
Adj. R <sup>2</sup>	-0.152	-0.112	-0.136	-0.159
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 17. Fixed-effects panel regression models with standard errors clustered by company on Social Score

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
S	0.000 (0.001)	0.003*** (0.001)	0.006*** (0.001)	0.003*** (0.000)
Log firm size	0.032 (0.033)	-0.169*** (0.016)	-0.217*** (0.038)	-0.068*** (0.021)
Log leverage	-0.140*** (0.016)	-0.040*** (0.007)	-0.093*** (0.013)	-0.008 (0.007)
Log capex	-0.062*** (0.015)	0.020*** (0.007)	-0.072*** (0.016)	0.009 (0.007)
R <sup>2</sup>	0.028	0.065	0.034	0.012
Adj. R <sup>2</sup>	-0.152	-0.109	-0.134	-0.160
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 18. Fixed-effects panel regression models with standard errors clustered by company on Governance Score

	Emerging markets		Developed markets	
	DV: ROA log	DV: TobinsQ log	DV: ROA log	DV: TobinsQ log
G	-0.001 (0.002)	0.000 (0.001)	0.004*** (0.001)	0.003*** (0.001)
Log firm size	0.040 (0.030)	-0.140*** (0.015)	-0.177*** (0.038)	-0.056*** (0.020)
Log leverage	-0.141*** (0.016)	-0.042*** (0.007)	-0.094*** (0.014)	-0.008 (0.007)
Log capex	-0.063*** (0.015)	0.018*** (0.007)	-0.075*** (0.016)	0.008 (0.007)
R <sup>2</sup>	0.028	0.060	0.030	0.011
Adj. R <sup>2</sup>	-0.152	-0.115	-0.139	-0.162
Num. obs.	11,971	11,971	10,472	10,472

Standard errors in parentheses clustered by city. All significance tests two-tailed. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## CHAPTER 5: CONCLUSION

This study examined the impact of ESG initiatives on corporate financial performance, over the period that extends from 2015 to 2022, by performing regressions on data from listed companies in developed and emerging markets. The data was sourced from Bloomberg and the sample includes 22443 observations derived from 4168 companies selected from FTSE Emerging Index and the FTSE Developed Index. The findings of this study are generally consistent with past studies, while significant differences existed among developed and emerging markets, on account of the impact of ESG performance on CFP. The main strength of this study lies in its broader dataset and sensitivity analyses in terms of model construction alternative proxies, which confirmed the robustness of the results.

The descriptive analysis results show that developed-market companies had higher ESG performance compared to emerging-market companies. Further, results showed that, on average, companies with higher disclosure levels of EVN, CSR, and CG have higher financial and valuation performance (ROA and Tobin's Q) in developed markets.

Results from the regression models suggest that in developed markets, there are positive and statistically significant relationships between the company's financial (ROA) and market value performance (Tobin's Q) and ESG scores. However, only market valuation had a significant positive relationship with ESG scores in the emerging market. Considering the sub-components of ESG (i.e. EVN, CSR, CG) that provide us different directions and mixed results compared to existing studies. All three components have significant positive associations with both ROA and Tobin's Q, which is in line with the existing findings in developed markets. By contrast, there is no significant relationship between EVN, CSR, CG and ROA in emerging markets. On top of that, the study found only environmental and social scores that show a significant and positive relationship with Tobin's Q. Furthermore, no support was found for the position that governance-related activities are associated with emerging market valuation. This outcome could be attributed to weak corporate governance practices in emerging markets and insufficient legal and regulatory oversight from national institutions. This scenario may deter international investors, as low governance scores suggest a certain level of risk, prompting them to divert their investments away from emerging market companies. This aligns with the conclusion drawn by Bahadori, Kaymak & Seraj (2021).

The results of this study have significant implications for regulators and researchers. It highlights the positive valuation effects of ESG initiatives undertaken by companies in developed and emerging markets. Companies should view ESG as an investment rather than a cost. Meeting environmental, social, and institutional requirements and addressing various stakeholder needs leads to value creation for companies. In today's unpredictable corporate landscape, these findings on the positive valuation effects of sustainability initiatives will benefit investors and other stakeholders, including regulators, policymakers, and social groups like community organisations. The positive valuation effects underscore the importance of integrating ESG practices into business strategies. Stakeholders would find value creation for the companies with greater ESG performance. This study also adds to the growing literature comparing ESG practices' impact on corporate financial performance between developed and emerging markets. The ESG practices in emerging markets are still at an early stage compared with developed markets, under a few key challenges that policymakers face, such as budgetary constraints, weak regulatory oversights, and legal systems to develop better ESG investment requirements. On the other hand, this also indicates significant potential for growth in ESG development within emerging markets, while developed markets are still leading the way.

## **CHAPTER 6: LIMITATIONS OF THE STUDY**

Previous studies showed that the nature of the enterprise and different industry attributes may affect the relationship between ESG and company performance (Ruan & Liu, 2021). Due to the limited scope and some data constraints, this paper examines the impact of ESG scores and corporate financial performance without considering industry classification as one of the control variables. This may have limited the study. As suggested by Garcia, Mendes-Da-Silva & Orsato (2017), the difference in business activities and the impact of ESG disclosure may be discrepant for enterprises in environmentally sensitive industries and non-environmentally sensitive industries. Duque-Grisales & Aguilera-Caracuel (2021) further suggested that, especially for environmental activities, most companies are bound to carry out comprehensive transformation and upgrades for their original equipment and processes to meet the environmental protection requirements set by the country or industry. This creates a heavier burden on them and then affects the performance level of the enterprise. However, as stated by Huang (2021), industry classification does not seem to be a statistically significant moderator of the ESG-CFP relationship and the evidence remains inconclusive. There is an opportunity in future studies to investigate the impact of enterprise nature and industry characteristics on the relationship between ESG performance and corporate financial performance.

This study focuses on corporate financial performance, which only captures the financial-based measures, namely ROA and Tobin's Q. A multi-dimensional approach could be conducted in the future to assess ESG impact on non-financial based company performance measures such as brand name recognition or company reputation (Bahadori, Kaymak & Seraj, 2021).

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# APPENDICES

## Appendix A: Histograms of Sample data

Figure 7: Histogram of sample distribution of ESG scores

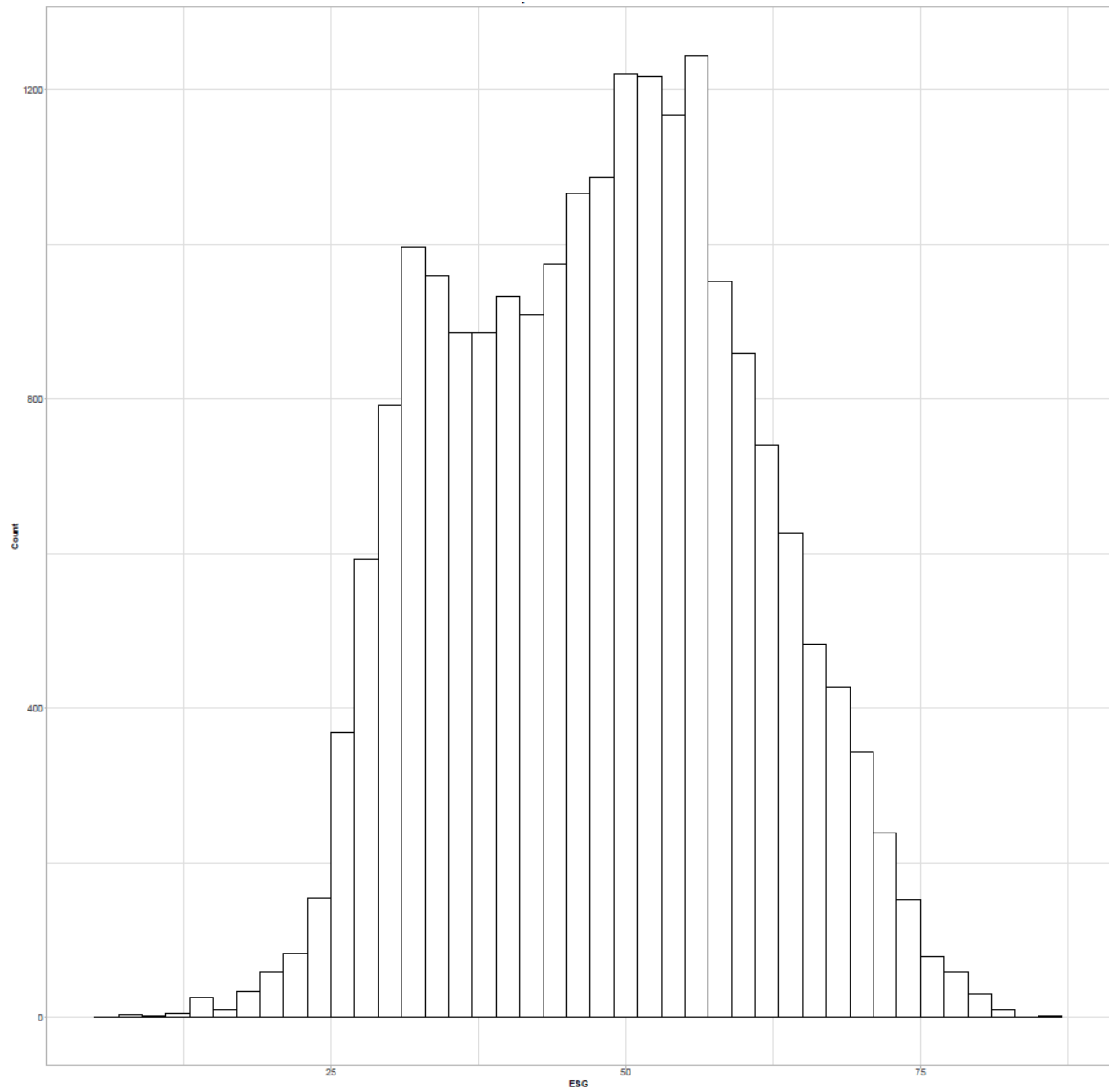


Figure 8: Histogram of sample distribution of Environmental Scores

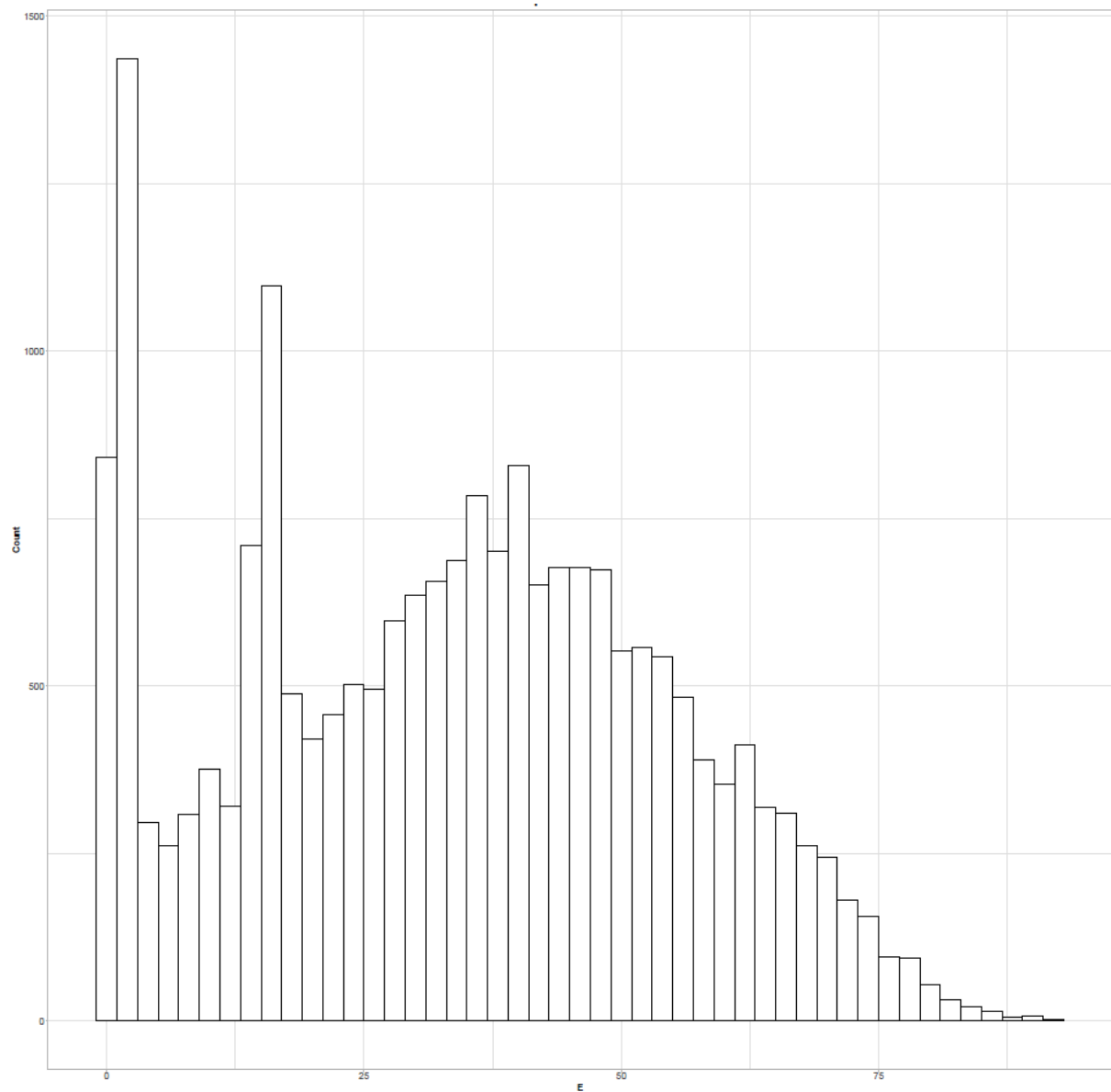


Figure 9: Histogram of sample distribution of Social Scores

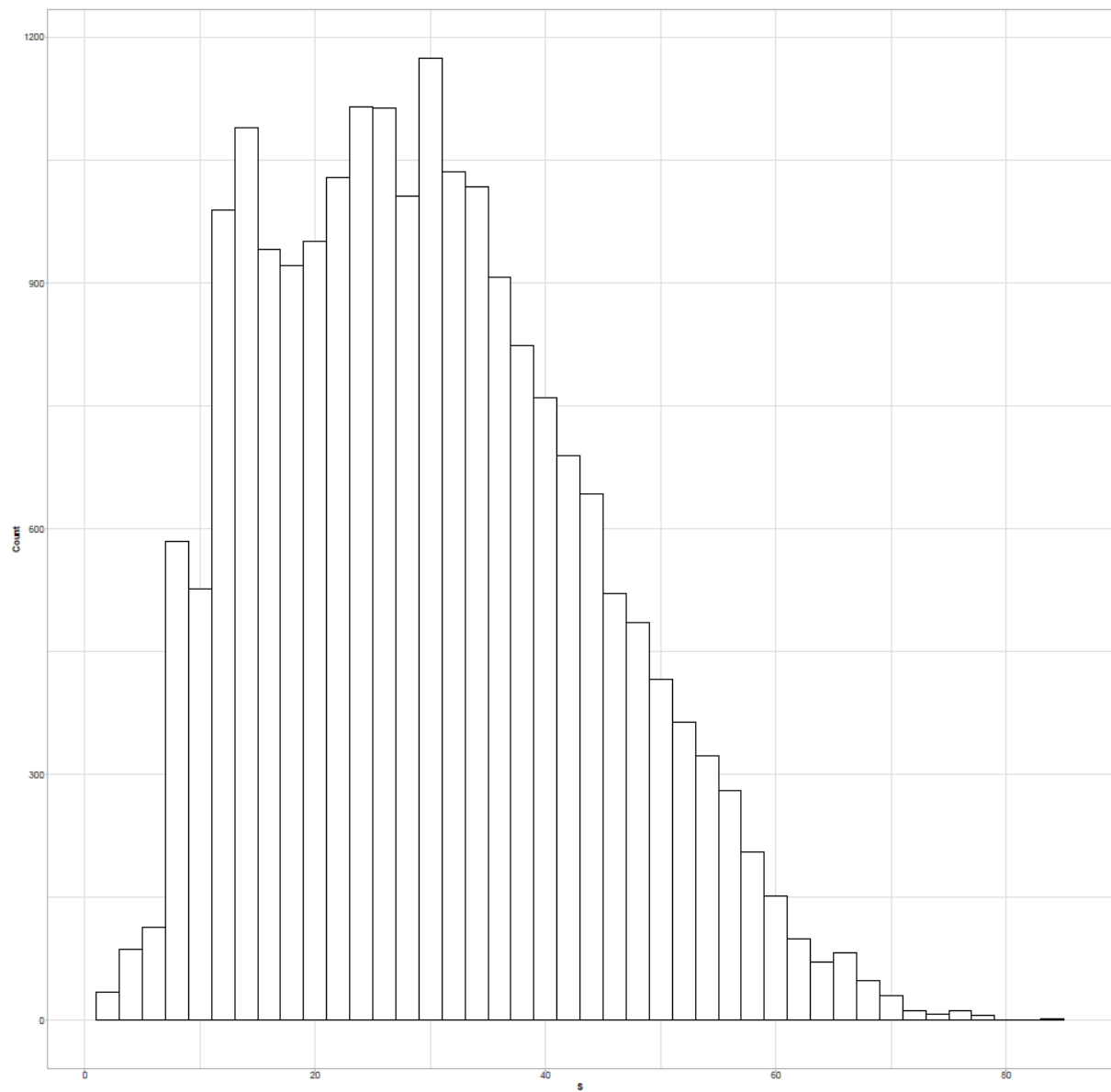


Figure 10: Histogram of sample distribution of Governance Scores

