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VALUING SUSTAINABILITY: THE ROLE OF ESG SCORES IN M&A AND PRIVATE EQUITY TRANSACTIONS

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List of abbreviations

Abreviación	**Meaning**
CSR	Corporate social responsibility
D/E	Debt-to-Equity Ratio
E	Environmental
EBIT	Earnings Before Interest and Taxes
EPS	Earnings Per Share
ESG	Environmental, Social, and Governance
ETFs	Exchange Traded Funds
EV	Enterprise Value
EV/EBITDA	Entreprise Value to Earnings Before Interest, Taxes, Depreciation and Amortization
EV/Sales	Enterprise Value to Sales
G	Governance
GPs	General partners
GRI	Global Reporting Initiative
ISS	Institutional Shareholder Services
LPs	Limited partners
M&A	Mergers & Acquisitions
MPT	Modern Portfolio Theory
MSCI	Morgan Stanley Capital International
N	Sample number
P/B	Price-to-Book Ratio
P/E	Price-to-Earnings Ratio
PE	Private Equity
PRI	Principles for Responsible Investment
S	Social
SASB	Sustainability Accounting Standards Board
SDGs	Sustainable Development Goals
SRI	Socially responsible investing
TCFD	Task Force on Climate-related Financial Disclosures

ABSTRACT

This research seeks to understand the relationship between Environmental, Social, and Governance (ESG) scores, as quantified by the Retinitiv Score, and company valuations in the context of Mergers & Acquisitions (M&A) and Private Equity (PE) transactions. The core inquiry is whether robust ESG policies, resulting in higher scores, correlate with increased financial valuation. To investigate this, we considered six pivotal financial metrics: EV/EBITDA, earnings per share (in dollars), EV/Sales, Price-to-Book Ratio, Debt-to-Equity Ratio, and the Price-to-Earnings Ratio.

Our exploration began with a thorough review of existing literature, tracing the growing emphasis on ESG considerations in financial and investment domains. This helped set the stage for our primary research, providing context on the evolution of ESG's importance and its integration in financial strategies. The literature also offered insights into how ESG factors have historically influenced investment decisions, especially in M&A and PE contexts.

The empirical phase of our study revealed a noteworthy connection between ESG scores and certain financial multiples, signifying the tangible influence of sustainable practices on company valuations. Our findings, thus, underscore that ESG considerations are not merely ethical or compliance-based but have distinct financial implications. This research brings to light the increasing integration of sustainability metrics in investment decisions and their potential value implications.

For investment practitioners, these findings offer a fresh perspective on the tangible benefits of integrating ESG considerations into their decision-making processes. While our study provides substantial insights, we recognize the vastness of the topic and advocate for more nuanced research, especially considering different industries and regional variations.

1. INTRODUCTION.

1.2. Background and Motivation.

The financial world is rapidly changing, and central to this evolution is the growing emphasis on sustainability and corporate responsibility. As we navigate the complexities of the modern era, challenges like climate change, social inequalities, and ethical business practices are becoming more pronounced. Companies and investors are now recognizing the need to address these issues, and as a result, the Environmental, Social, and Governance (ESG)[1] criteria have taken center stage in decision-making processes.

Historically, the primary focus when valuing companies was their tangible assets and immediate profits. This perspective, while still relevant, has expanded[2]. Today's investors and stakeholders are looking beyond just the numbers. They are keenly interested in how a company operates, its impact on the environment, its treatment of employees, and its stance on social issues. In essence, the health of a company, its ethical, social, and environmental footprints, is now under the microscope.

The Retinitiv Score serves as a testament to this shift in perspective. By offering a measure of a company's sustainability performance, it provides a lens through which we can view the broader implications of a company's actions. This research aims to delve into the nuances of this relationship, exploring the intricate dynamics between ESG performance and a company's valuation. By doing so, it hopes to shed light on the tangible and intangible factors that contribute to a company's perceived market value.

Areas like Mergers and Acquisitions (M&A) and Private Equity (PE) stand to benefit immensely from this understanding. In these sectors, the valuation of a company isn't just

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[1] Rumyantseva, A., & Tarutko, O. (2022, November). Impact of the ESG Principles on the Corporate Financial Strategy. In *Challenges and Solutions in the Digital Economy and Finance: Proceedings of the 5th International Scientific Conference on Digital Economy and Finances (DEFIN 2022), St. Petersburg 2022* (pp. 309-318). Cham: Springer International Publishing.

[2] Jagannathan, R., Ravikumar, A., & Sammon, M. (2017). *Environmental, social, and governance criteria: Why investors are paying attention* (No. w24063). National Bureau of Economic Research.

about numbers; it's about potential, growth, and future impact. If ESG scores can provide insights into these aspects, they could revolutionize the way businesses are evaluated, acquired, and merged.

Furthermore, as the global community becomes more interconnected, the ripple effects of a company's actions are felt far and wide. Consumers, now more than ever, are informed and conscious of their choices[3]. A company's commitment to sustainability and ethical practices can influence consumer loyalty, stakeholder trust, and overall brand perception. Companies with commendable ESG scores might find themselves in a favorable position[4], not just in terms of market valuation but also in terms of public perception and trust.

In conclusion, this research isn't just about numbers and scores; it's about understanding the evolving landscape of the financial world. It's about recognizing the intertwined relationship between sustainability, ethics, and business success. By exploring the connection between ESG principles and financial valuation, this study hopes to provide insights that will shape the future trajectory of business, finance, and society.

1.2. Research question and Objectives.

Research Question: Does the ESG score, as measured by the Retinitiv Score, correlate with the valuation multiples of companies, thereby influencing M&A and PE Transactions?

Objectives:

a. **Understanding the ESG Score:** To delve into the intricacies of the ESG score, particularly the Retinitiv Score, and understand its components and significance in evaluating a company's sustainability practices.

[3] Teor, T. R., Ilyina, I. A., & Kulibanova, V. V. (2022, April). The Influence of ESG-concept on the Reputation of High-technology Enterprises. In *2022 Communication Strategies in Digital Society Seminar (ComSDS)* (pp. 184-189). IEEE.

[4] Maaloul, A., Zéghal, D., Ben Amar, W., & Mansour, S. (2023). The effect of environmental, social, and governance (ESG) performance and disclosure on cost of debt: The mediating effect of corporate reputation. *Corporate Reputation Review*, *26*(1), 1-18.

b. **Analyzing the Correlation:** To statistically analyze the relationship between a company's ESG score and its valuation multiples. This will involve gathering data on companies' ESG scores and their respective valuation multiples.

c. **Comparative Analysis:** To compare companies with high ESG scores against those with lower scores in terms of their valuation multiples and attractiveness in M&A and Private Equity deals.

d. **Practical Implications:** To provide insights and recommendations for investors, policymakers, and companies on the importance of ESG scores in investment decisions and transaction evaluations.

1.3. Structure of the thesis.

This thesis is organized into eight main sections, each designed to provide a comprehensive understanding of the role and impact of ESG scores, particularly the Retinitiv Score, on M&A and PE Transactions.

Chapter 1: Introduction:

This chapter sets the stage for the research, providing the background, motivation, research questions, objectives, and an overview of the structure of the thesis.

Chapter 2: Literature Review:

An in-depth exploration of existing literature on ESG factors, their role in investment decision-making, theoretical frameworks for ESG integration, empirical studies on ESG and financial performance, ESG ratings and reporting standards, and the context of ESG in M&A and private equity.

Chapter 3: Methodology:

Details the research design and approach, sources of data, sample selection criteria, and the methods used for data analysis.

Chapter 4: Results and Analysis:

Presents the findings from the research, including ESG practices in M&A and PE, the empirical analysis of the impact of ESG factors on investment decisions, and case studies of ESG integration in M&A and private equity deals.

Chapter 5: Discussion:

A comprehensive discussion of the findings, their implications for investment practitioners and policymakers, and an exploration of the limitations of the study and directions for future research.

Chapter 6: Conclusion:

Summarizes the main points of the research, its contributions to the literature on ESG factors and investment decision-making and offers practical implications and recommendations.

Chapter 7: References:

Lists all the sources cited throughout the thesis, providing readers with a roadmap to the foundational literature and studies that informed the research.

Chapter 8: Appendix:

Contains additional data, tables, and figures that support the analysis and findings presented in the main body of the thesis.

By following this structure, the thesis aims to provide an understanding of the topic, moving from foundational knowledge to specific findings, and concluding with broader implications and recommendations.

2. LITERATURE REVIEW.

2.1 Understanging ESG Framework and Its Evolution.

ESG refers to the three central factors in measuring the sustainability and ethical impact of an investment, project or policy in a company or business[5]. These criteria are pivotal in determining the future financial performance of companies and as we will discuss later, also its own company valuation, both in terms of returns and risks. The ESG Frameworks is divided in 3 different dimensions:

- **Environmental (E)**: This dimension pertains to a company's role as a steward of the natural environment. It encompasses a company's energy use, waste management, pollution control, natural resource conservation, and treatment of animals. Additionally, this criterion evaluates potential environmental risks a company might face and how those risks are managed[6]. For instance, companies might face financial repercussions for hazardous waste spills or public backlash for engaging in deforestation.
- **Social (S)**: This dimension examines how a company manages relationships with its employees, suppliers, customers, and the communities where it operates. It evaluates how a company promotes diversity and inclusion, ensures the health and safety of its workers, and upholds fair labor practices. Furthermore, it scrutinizes a company's product safety, quality, integrity, and its stance on broader societal issues like human rights[7].
- **Governance (G)**: This dimension pertains to a company's leadership structure, executive compensation, audits, internal controls, and shareholder rights. Governance addresses the internal system of practices, controls, and procedures a company adopts to govern itself, make effective decisions, comply with legal

[5] Friedman, H. L., Heinle, M. S., & Luneva, I. M. (2021). A theoretical framework for ESG reporting to investors. *Available at SSRN 3932689*.

[6] Bose, S. (2020). Evolution of ESG reporting frameworks. *Values at Work: Sustainable Investing and ESG Reporting*, 13-33.

[7] Becchetti, L., Bobbio, E., Prizia, F., & Semplici, L. (2022). Going deeper into the S of ESG: a relational approach to the definition of social responsibility. *Sustainability*, *14*(15), 9668.

requirements, and meet the needs of external stakeholders. It also encompasses issues like the composition and diversity of the board of directors and potential conflicts of interest[8].

The ESG framework has gained significant traction as investors increasingly seek to align their portfolios with their values, ensuring they invest in companies that are not only profitable but also operate responsibly. The Retinitiv Score[9], one among many other, is a notable tool that measures a company's performance against these ESG criteria, providing a quantitative score and unbiased score, based on publicly-reported data, facilitating comparisons between companies or against global or industry benchmarks.

Historically, the primary focus of investments was to generate financial returns, with little to no consideration for environmental or social implications. However, the late 20th century saw a paradigm shift with the emergence of socially responsible investing (SRI)[10], which emphasized not just financial returns but also the broader impact of investments on society and the environment.

The 1980s and 1990s witnessed the rise of divestment campaigns, particularly against companies involved in apartheid South Africa[11]. These movements laid the groundwork for the integration of ethical considerations into investment decisions[12]. By the early 2000s, the concept of ESG had started to take shape, driven by increasing awareness of global challenges like climate change, human rights abuses, and corporate governance scandals[13].

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[8] Agnese, P., Battaglia, F., Busato, F., & Taddeo, S. (2023). ESG controversies and governance: Evidence from the banking industry. *Finance Research Letters*, *53*, 103397.

[9] Apergis, N., Poufinas, T., & Antonopoulos, A. (2022). ESG scores and cost of debt. *Energy Economics*, *112*, 106186.

[10] Sparkes, R. (2003). *Socially responsible investment: A global revolution*. John Wiley & Sons.

[11] Eccles, R. G., & Stroehle, J. C. (2018). Exploring social origins in the construction of ESG measures. *Available at SSRN 3212685*.

[12] Dunfee, T. W. (1988). The Divestiture of U.S. Direct Investment in South Africa. *Journal of Business Ethics, 7*(4), 287-293.

[13] Compact, U. G. (2004). Who cares wins: Connecting financial markets to a changing world. *New York*.

The 2015 adoption of the United Nations Sustainable Development Goals (SDGs)[14] further accelerated the ESG movement by setting clear global targets for sustainability. As a result, ESG considerations have transitioned from being 'nice-to-have' to 'must-have' in investment decisions. Today, ESG investing is not just about risk mitigation but also about identifying opportunities for sustainable growth in a rapidly changing global landscape.

In the context of M&A and PE transactions, the ESG framework's significance has grown exponentially. Companies with robust ESG practices are often seen as more attractive investment opportunities, as they are better poised to mitigate risks and capitalize on new market opportunities. On the other hand, companies with weak ESG practices may be perceived as riskier ventures.

In subsequent sections, we will explore in greater depth how the ESG framework influences financial strategies, the theoretical underpinnings of ESG integration, and empirical studies linking ESG to financial performance.

2.2 How ESG Influences Financial Strategies.

The ascendancy of ESG factors in investment decision-making has been nothing short of transformative. Once regarded as ancillary considerations, ESG factors have now firmly entrenched themselves as central elements in the investment process and financial operations. This metamorphosis is underpinned by a heightened awareness of the financial implications of ESG risks and opportunities, coupled with evolving societal values, regulatory landscapes, and shifting consumer preferences. Today, ESG considerations are paramount in the decision-making apparatus of investors, especially within the realms of M&A and PE.

- **Risk Mitigation**: One of the primary ways ESG factors influence financial strategies is through risk mitigation. Companies that adhere to robust ESG standards are often better positioned to navigate regulatory challenges,

[14] United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. Retrieved from https://sustainabledevelopment.un.org/post2015/transformingourworld

environmental liabilities, and potential reputational damages[15]. For instance, a company with strong environmental practices may be less likely to face penalties or cleanup costs associated with environmental incidents[16].

- **Investor Attraction**: The modern investor, both institutional and individual, is increasingly conscious of ESG factors. Investment funds that prioritize ESG-compliant companies often attract more capital[17]. This influx of capital can lead to a potential increase in the valuation of companies that score high on ESG metrics, especially in the context of M&A and PE transactions[18].
- **Operational Efficiency**: ESG practices, particularly those under the environmental domain, can lead to operational efficiencies. Companies that invest in sustainable energy sources or waste reduction techniques might realize cost savings in the long run, making them attractive targets in M&A scenarios or valuable assets in PE portfolios[19].
- **Access to Capital**: Companies with strong ESG credentials often find it easier to access capital at favorable terms[20]. Lenders and investors view these companies as less risky, leading to lower borrowing costs. This financial advantage can play a pivotal role in M&A and PE deals, where access to capital can influence transaction dynamics[21].
- **Brand and Reputation**: In today's interconnected world, a company's reputation is invaluable. Firms recognized for their ESG efforts often enjoy enhanced brand

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[15] Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of sustainable finance & investment*, *5*(4), 210-233.

[16] Lee, D. D., & Faff, R. W. (2009). Corporate sustainability performance and idiosyncratic risk: A global perspective. *Financial Review*, *44*(2), 213-237.

[17] Clark, G. L., Feiner, A., & Viehs, M. (2015). From the stockholder to the stakeholder: How sustainability can drive financial outperformance. *Available at SSRN 2508281*.

[18] Renneboog, L., Ter Horst, J., & Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of corporate finance*, *14*(3), 302-322.

[19] Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management science*, *60*(11), 2835-2857.

[20] Bain & Company. (2019). Global Private Equity Report. *Bain & Company*.

[21] KPMG. (2018). The ESG imperative for private equity firms. *KPMG International*.

loyalty, which can translate into higher sales and profitability[22]. In the M&A and private equity sectors, a strong reputation can command premium valuations and influence deal outcomes.

- **Long-term Strategic Planning**: ESG factors encourage companies to adopt a long-term perspective in their strategic planning. This long-term view can lead to sustainable growth strategies that are resilient to market fluctuations and external shocks, making such companies attractive targets in M&A and PE transactions[23].

In the M&A domain, ESG considerations have become indispensable components of the due diligence process. Prospective acquirers or investors meticulously assess the ESG performance of target entities. This rigorous evaluation is designed to unearth any latent ESG-related risks that could potentially compromise the post-merger integration, adversely influence future financial trajectories, or tarnish the reputation of the consolidated entity[24].

PE, a significant player in the financial world, is undergoing a notable shift, placing a stronger emphasis on ESG factors. This isn't a mere trend; it's a strategic evolution. General partners (GPs), the main decision-makers in private equity firms, are actively adjusting their investment strategies to align more closely with ESG values. This alignment is not just a nod to current trends but a response to a combination of factors: increasing demands from their limited partners (LPs), evolving societal values, and a regulatory landscape that's becoming more stringent.

This growing focus on ESG isn't isolated to the private equity world. Across industries, there's a rising expectation for companies to operate responsibly and sustainably. Stakeholders, ranging from investors and customers to employees and regulators, are now more informed and demand transparency. They want to associate with

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[22] Louche, C., Arenas, D., & Van Cranenburgh, K. C. (2012). From preaching to investing: Attitudes of religious organisations towards responsible investment. *Journal of business ethics*, *110*, 301-320.

[23] Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The quarterly journal of economics*, *118*(1), 107-156.

[24] Capelle-Blancard, G., & Monjon, S. (2012). Trends in the literature on socially responsible investment: Looking for the keys under the lamppost. *Business ethics: a European review*, *21*(3), 239-250.

firms that prioritize long-term sustainability over short-term gains. As a result, ESG considerations have rapidly moved from the periphery to the core, becoming integral in shaping operational and strategic decisions, especially in areas like M&A and PE.

However, as with any significant shift, the road to comprehensive ESG integration is paved with challenges. For one, there's the complexity of understanding the vast landscape of ESG, which requires both depth and breadth of knowledge. Then there's the challenge of data — having access to reliable, detailed ESG data is crucial[25]. Moreover, the methodologies to analyze this data are still evolving, requiring firms to be both agile and discerning. The industry also faces issues like "greenwashing,"[26] where companies might exaggerate their eco-friendly initiatives, inconsistencies in ESG reporting standards, and the challenge of navigating varied interpretations of what truly constitutes a responsible investment.

Yet, despite these challenges, the potential advantages of ESG integration are undeniable and multifaceted. Companies that successfully integrate ESG factors can better mitigate risks, uncover untapped value creation opportunities, foster stronger and more genuine stakeholder relationships, and often achieve superior financial performance[27]. These benefits provide a compelling case for firms to embed ESG considerations deeply into their M&A and PE strategies.

This focus on ESG sets the stage for deeper exploration in the subsequent sections of this chapter. Readers can anticipate a dive into the theoretical foundations of ESG, a review of empirical research highlighting its financial implications, an examination of the growing importance of ESG ratings, and a detailed look at the nuances of ESG within the specific contexts of M&A and PE. The overarching aim is to offer a comprehensive and clear understanding of the pivotal role ESG is playing in shaping the modern landscapes of M&A and PE.

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[25] Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. *The accounting review*, *91*(6), 1697-1724.

[26] Riedl, A., & Smeets, P. (2017). Why do investors hold socially responsible mutual funds?. *The Journal of Finance*, *72*(6), 2505-2550.

[27] Barnett, M. L., & Salomon, R. M. (2012). Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. *Strategic management journal*, *33*(11), 1304-1320.

2.3 Theoretical Frameworks for ESG Integration.

The integration of ESG factors into investment strategies has become a focal point in contemporary finance. As the global landscape evolves, recognizing the profound impact of ESG factors on financial performance is crucial. To navigate this intricate landscape, a myriad of theoretical frameworks has emerged, offering deeper insights into the symbiotic relationship between ESG considerations and financial outcomes. These frameworks not only guide the systematic incorporation of ESG considerations but also shed light on their potential influence on investment outcomes.

Modern Portfolio Theory (MPT): A foundational concept in investment management, MPT underscores the merits of portfolio diversification. Historically, diversification was viewed purely through the lens of financial assets. However, with the rise of ESG considerations, MPT has been extended to suggest that diversification should encompass not just traditional financial metrics but also ESG factors. Such an approach can lead to a more resilient and balanced portfolio, optimizing returns and risk management. Furthermore, MPT posits that companies with strong ESG practices may be more resilient to market shocks, operationally efficient, and possess a competitive edge, making them attractive investment candidates[28].

Stakeholder Theory: This theory emphasizes that businesses have responsibilities to a broad spectrum of stakeholders, including employees, customers, communities, and the environment. In an era where corporate social responsibility is gaining traction, companies that prioritize ESG considerations can foster stronger relationships with these stakeholders[29]. This not only enhances their reputation but also drives sustainable financial performance[30]. This perspective positions ESG integration as not just a financial strategy but a reflection of a company's broader societal commitments.

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[28] Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management science*, *60*(11), 2835-2857.

[29] Renneboog, L., Ter Horst, J., & Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of corporate finance*, *14*(3), 302-322.

[30] Clark, G. L., Feiner, A., & Viehs, M. (2015). From the stockholder to the stakeholder: How sustainability can drive financial outperformance. *Available at SSRN 2508281*.

Theory of Sustainable Finance: An emerging perspective, this theory advocates for the holistic integration of financial and non-financial factors. It underscores that sustainability issues, encapsulated by ESG factors, can significantly influence a company's financial trajectory and long-term sustainability. In a world grappling with climate change and social inequalities, proactive management of ESG risks and opportunities can lead to superior risk-adjusted returns and a competitive advantage over peers[31].

In addition to these academic theories, practical frameworks have been established by global entities to streamline ESG integration. The **UN-supported Principles for Responsible Investment (PRI)** offers a global benchmark for weaving ESG factors into investment practices[32]. **The Sustainability Accounting Standards Board (SASB)** provides industry-tailored standards for sustainability disclosure, facilitating effective communication of material ESG information to investors. The **Task Force on Climate-related Financial Disclosures (TCFD)** has crafted recommendations for robust climate-related disclosures, fostering informed investment decisions in an era of climate uncertainty.

Frameworks like the **Global Reporting Initiative (GRI)** and the **Integrated Reporting Framework** further standardize ESG reporting, enabling investors to efficiently compare ESG data across companies and sectors[33]. By embracing these standards, businesses can offer more consistent and transparent ESG insights, bolstering informed investment choices.

Yet, the practical application of these frameworks presents challenges. The global investment community grapples with issues such as data quality concerns, varied interpretations of ESG factors, and the potential for greenwashing. Despite these hurdles,

[31] El Ghoul, S., Guedhami, O., Kwok, C. C., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital?. *Journal of banking & finance*, *35*(9), 2388-2406.

[32] Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of financial economics*, *115*(2), 304-329.

[33] Busch, T., Bauer, R., & Orlitzky, M. (2016). Sustainable development and financial markets: Old paths and new avenues. *Business & Society*, *55*(3), 303-329.

these theoretical and practical guidelines offer invaluable insights for investors aiming to integrate ESG considerations seamlessly.

As this chapter progresses, we will delve deeper into empirical studies exploring the nexus between ESG and financial performance, the role of ESG ratings and reporting standards, and the specific nuances of ESG within M&A and private equity. By building on these theoretical foundations, this section aims to elucidate the transformative role of ESG in shaping contemporary investment paradigms, offering readers a comprehensive understanding of its significance in today's financial world.

2.4 Empirical Studies on ESG and Financial Performance.

The integration of ESG factors into investment strategies has been a focal point of academic and industry research over the past few decades. Empirical studies, which provide evidence-based insights, are pivotal in shaping the discourse around the relationship between ESG considerations and financial performance. This section offers a comprehensive review of these studies, elucidating key findings and their implications for the investment community.

2.4.1 Historical Perspective and Evolution.

Historically, the realm of ESG research was fraught with skepticism. Early studies often yielded inconclusive or even insignificant relationships between ESG factors and financial outcomes[34]. However, with advancements in data collection, analytics, and a broader understanding of sustainability, the narrative began to shift[35]. As the discipline matured, a growing body of research started to highlight a positive correlation between robust ESG practices and enhanced financial returns. This evolution challenged the prevailing notion that there was an inherent trade-off between societal/environmental concerns and financial performance.

[34] Clark, G. L., Feiner, A., & Viehs, M. (2015). From the stockholder to the stakeholder: How sustainability can drive financial outperformance. *Available at SSRN 2508281*.

[35] Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. *The accounting review*, *91*(6), 1697-1724.

2.4.2 Key Empirical Findings.

A plethora of empirical studies have consistently underscored the financial merits of strong ESG practices[36]. Companies with high ESG ratings have been found to outperform their lower-rated peers across various financial metrics[37]. This includes not just traditional metrics like return on assets and equity, but also indicators of operational efficiency, innovation capacity, and stakeholder trust. Such findings suggest that ESG performance can be a reliable barometer of a company's overall health and future prospects.

2.4.3 ESG and Risk Management.

Risk management, a cornerstone of modern corporate strategy, has been significantly influenced by ESG considerations[38]. Empirical research has illuminated how companies with proactive ESG strategies exhibit reduced exposure to a myriad of business risks[39]. This encompasses everything from environmental liabilities and regulatory penalties to reputational damages stemming from governance failures. Effective ESG practices, therefore, act as a buffer, shielding companies from unforeseen adversities and market volatilities.

2.4.4 ESG and Stock Performance.

The stock market's reaction to ESG has been a subject of intense scrutiny[40]. Empirical evidence has consistently shown that companies with strong ESG credentials often see their stocks outperforming those of their peers[41]. This outperformance is particularly

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[36] Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of sustainable finance & investment*, *5*(4), 210-233.

[37] Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management science*, *60*(11), 2835-2857.

[38] Crifo, P., & Mottis, N. (2016). Socially responsible investment in France. *Business & Society*, *55*(4), 576-593.

[39] Lee, D. D., & Faff, R. W. (2009). Corporate sustainability performance and idiosyncratic risk: A global perspective. *Financial Review*, *44*(2), 213-237.

[40] Statman, M., & Glushkov, D. (2009). The wages of social responsibility. *Financial Analysts Journal*, *65*(4), 33-46.

[41] Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. *Journal of Financial economics*, *101*(3), 621-640.

pronounced during economic downturns or market crises, suggesting that ESG considerations offer a layer of protection against market vagaries.

2.4.5 Variability in Empirical Outcomes.

While a vast majority of research points towards a favorable ESG-financial performance relationship, it's imperative to recognize the variability in these findings[42]. Some studies, depending on their methodology, data sources, or regional focus, report more muted or even contradictory correlations. Such disparities underscore the multifaceted nature of ESG and the myriad factors that can influence its relationship with financial performance.

2.4.6 Investor Perspective on ESG Funds.

From an asset management perspective, the rise of ESG-centric mutual funds and ETFs has been noteworthy[43]. Empirical analyses comparing the performance of these funds with traditional investment vehicles have been largely positive[44]. Many ESG-focused funds have not only matched but often exceeded the returns of their conventional counterparts, further solidifying the financial case for ESG integration.

2.4.7 Sectoral and Regional Insights.

Certain sectors, given their operational nature, might display a more pronounced relationship between ESG and financial performance[45]. For instance, industries with significant environmental footprints, like energy, utilities, or manufacturing, often find that robust ESG practices can directly influence their bottom lines. Similarly, companies

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[42] Revelli, C., & Viviani, J. L. (2015). Financial performance of socially responsible investing (SRI): what have we learned? A meta-analysis. *Business Ethics: A European Review*, *24*(2), 158-185.

[43] Renneboog, L., Ter Horst, J., & Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of corporate finance*, *14*(3), 302-322.

[44] Gil-Bazo, J., Ruiz-Verdú, P., & Santos, A. A. (2010). The performance of socially responsible mutual funds: The role of fees and management companies. *Journal of Business Ethics*, *94*, 243-263.

[45] Busch, T., Bauer, R., & Orlitzky, M. (2016). Sustainable development and financial markets: Old paths and new avenues. *Business & Society*, *55*(3), 303-329.

operating in regions with stringent environmental or social regulations might exhibit a stronger ESG-financial performance correlation.

2.4.8 Future Directions in Empirical Research.

The dynamic nature of the ESG landscape implies that empirical research in this domain will remain an evolving field[46]. As global challenges like climate change, social inequities, and governance scandals intensify, the depth and breadth of ESG-related studies are set to expand. Future research will likely delve deeper into sector-specific impacts, the role of technological advancements in ESG reporting, and the evolving expectations of the investor community.

2.4.9 Conclusion.

Empirical studies on ESG and financial performance serve as a compass for investors navigating the complex terrains of sustainable investing. By shedding light on the tangible benefits and potential pitfalls of ESG integration, these studies play a pivotal role in shaping investment strategies. As we delve deeper into this chapter, we will further explore the nuances of ESG ratings, reporting standards, and its implications in the specialized domains of M&A and PE. Through this exploration, we aim to provide readers with a nuanced, holistic understanding of the multifaceted role ESG plays in the modern financial ecosystem.

2.5 ESG Ratings and Reporting Standards.

In today's multifaceted financial landscape, ESG ratings and reporting standards have emerged as quintessential instruments for discerning a company's dedication to sustainable practices. These tools, rooted in rigorous research and analysis, offer a structured framework for evaluating, comparing, and communicating ESG metrics. This section delves deeper into the evolution, significance, challenges, and future prospects of ESG ratings and reporting standards, emphasizing their pivotal role in shaping the investment ecosystem.

[46] Derwall, J., Guenster, N., Bauer, R., & Koedijk, K. (2005). The eco-efficiency premium puzzle. *Financial Analysts Journal*, *61*(2), 51-63.

2.5.1 The Growing Importance of ESG Ratings.

ESG ratings, which have evolved over the past few decades, serve as comprehensive evaluations that assess a company's performance across environmental, social, and governance dimensions. These ratings, meticulously crafted by specialized ESG rating agencies such as Morgan Stanley Capital International (MSCI) ESG Research, Sustainalytics, and Institutional Shareholder Services (ISS) ESG, provide investors with a rich tapestry of data, facilitating a more holistic approach to investment analysis[47].

Key facets of ESG ratings include:

- **Risk Mitigation**: ESG ratings help identify potential vulnerabilities linked to a company's ESG practices, enabling investors to adopt proactive risk management strategies[48].
- **Comparative Analysis**: These ratings allow for a benchmarking of a company's ESG performance against industry peers or global standards, fostering more nuanced investment strategies.
- **Informed Investment**: With standardized ratings, investors can seamlessly integrate ESG insights into their broader investment paradigms, ensuring that their capital is channeled towards sustainable endeavors.

2.5.2 A Deep Dive into ESG Reporting Standards.

To navigate the intricacies of ESG ratings, several global initiatives have championed the cause of standardizing ESG reporting. Among the most influential are:

- **Global Reporting Initiative (GRI)**: A universally recognized standard, GRI aids businesses and governments in articulating their impact on pivotal sustainability

[47] Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of sustainable finance & investment*, *5*(4), 210-233.

[48] Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. *The accounting review*, *91*(6), 1697-1724.

issues. Its comprehensive framework addresses everything from climate change to governance, ensuring a holistic approach to sustainability reporting[49].

- **Sustainability Accounting Standards Board (SASB)**: SASB offers industry-tailored standards, emphasizing the financial relevance of ESG factors. By focusing on decision-useful sustainability information, SASB ensures that companies present data that's both relevant and actionable for investors[50].
- **Task Force on Climate-related Financial Disclosures (TCFD)**: With the escalating urgency of climate change, TCFD's recommendations have become indispensable. By guiding companies in revealing their climate-associated risks and opportunities, TCFD ensures that investors are well-informed about potential climate-related impacts on their investments[51].

2.5.3 Challenges and Complexities in ESG Ratings and Reporting.

While ESG ratings and reporting standards have undeniably advanced the cause of sustainable investing, challenges persist:

- **Diverse Methodologies**: The absence of a unified methodology across rating agencies can lead to discrepancies, complicating cross-company or cross-agency comparisons. This diversity often stems from the different priorities and focuses of each agency[52].
- **Data Integrity and Consistency**: The reliability of ESG ratings hinges on the quality and consistency of company disclosures. Incomplete or inconsistent data

[49] KPMG. (2017). The road ahead: The KPMG Survey of Corporate Responsibility Reporting 2017. Available at: https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/10/kpmg-survey-of-corporate-responsibility-reporting-2017.pdf

[50] Rinaldi, L., Unerman, J., & De Villiers, C. (2018). Evaluating the integrated reporting journey: insights, gaps and agendas for future research. *Accounting, Auditing & Accountability Journal*, *31*(5), 1294-1318.

[51] Carney, M. (2015). Breaking the tragedy of the horizon–climate change and financial stability. *Speech given at Lloyd's of London*, *29*, 220-230.

[52] Chatterji, A. K., Durand, R., Levine, D. I., & Touboul, S. (2016). Do ratings of firms converge? Implications for managers, investors and strategy researchers. *Strategic Management Journal*, *37*(8), 1597-1614

can skew ratings, potentially misleading investors. The challenge lies in ensuring that companies across the globe adhere to consistent reporting standards[53].

- **Greenwashing Concerns**: The practice of overstating sustainability initiatives, known as greenwashing, remains a significant concern. This emphasizes the need for rigorous, transparent reporting and the establishment of mechanisms to penalize misleading practices[54].

2.5.4 The Road Ahead: Future Prospects and Evolutions.

The trajectory of ESG ratings and reporting standards is undoubtedly upward. As sustainable investing continues to gain momentum, there's a burgeoning demand for consistent, transparent, and reliable ESG data. Collaborative endeavors between rating agencies, regulatory entities, and investors can lead to more robust, universally accepted standards. Such progress will not only bolster the credibility of ESG ratings but also promote a more sustainable investment ecosystem[55].

Furthermore, companies that adhere to high ESG standards and maintain transparent reporting practices often find themselves in a favorable position. They not only attract investments but also benefit from reduced borrowing costs, enhanced brand reputation, and increased resilience against market fluctuations and regulatory shifts[56].

As we transition into the subsequent sections of this chapter, we'll delve deeper into the integration of ESG metrics within M&A and PE. Building on the foundational understanding of ESG ratings and reporting standards, we aim to elucidate how these tools influence transactional decisions in these specific sectors. Through this comprehensive exploration, this chapter endeavors to enhance the reader's grasp of the

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[53] Ioannou, I., & Serafeim, G. (2015). The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. *Strategic management journal*, *36*(7), 1053-1081.

[54] Lyon, T. P., & Montgomery, A. W. (2015). The means and end of greenwash. *Organization & Environment*, *28*(2), 223-249.

[55] Busch, T., Bauer, R., & Orlitzky, M. (2016). Sustainable development and financial markets: Old paths and new avenues. *Business & Society*, *55*(3), 303-329.

[56] Flammer, C. (2018). Corporate green bonds. *Journal of Financial Economics,* 130(3), 415-439.

pivotal role ESG plays in contemporary investment decision-making, ensuring that sustainability remains at the forefront of financial strategies.

2.6 ESG IN THE CONTEXT OF M&A AND PRIVATE EQUITY.

In today's rapidly transforming global financial landscape, the integration of ESG criteria into investment strategies has emerged as a cornerstone, especially within the realms of M&A and PE. This chapter seeks to offer a profound exploration of ESG's multifaceted role within these sectors, emphasizing its pivotal influence in sculpting investment and operations decisions and the broader contours of the financial market ecosystem.

2.6.1 ESG and Mergers & Acquisitions.

M&A, traditionally guided by financial metrics, strategic fit, and market positioning, are now experiencing a paradigm shift, with ESG considerations taking center stage. Several factors are driving this transformation:

- **Risk Management**: Companies that embed ESG practices into their operations often demonstrate superior risk management capabilities. Such firms are adept at circumventing regulatory, environmental, and social challenges, thereby reducing potential post-acquisition liabilities and enhancing the overall value proposition of the transaction. This proactive approach to risk can lead to smoother integration processes post-acquisition and long-term synergies[57].
- **Reputation and Brand Value**: In an era where information travels at the speed of light, corporate reputation has become an invaluable asset. Acquiring a company with an impeccable ESG track record can significantly elevate the brand value and public perception of the acquiring entity, leading to long-term benefits such as customer loyalty, employee retention, and stakeholder trust[58].

[57] Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of sustainable finance & investment*, *5*(4), 210-233.

[58] Kölbel, J. F., Busch, T., & Jancso, L. M. (2017). How media coverage of corporate social irresponsibility increases financial risk. *Strategic Management Journal*, *38*(11), 2266-2284.

- **Stakeholder Expectations**: Modern stakeholders, encompassing investors, customers, employees, and even communities, are increasingly demanding responsible and sustainable business practices. M&A strategies that prioritize entities with robust ESG credentials can cater to these evolving demands, fostering deeper stakeholder relationships and potentially ensuring more successful post-acquisition integrations[59].

2.6.2 ESG in Private Equity Investments.

PE, characterized by its meticulous due diligence and long-term investment horizon, is at the forefront of integrating ESG factors into its investment criteria. This trend is propelled by:

- **Long-term Value Creation**: Given the extended investment horizons typical of PE, the sustainability and resilience of portfolio companies, underpinned by solid ESG practices, align seamlessly with the objectives of PE firms. Such alignment can lead to sustainable growth trajectories and enhanced shareholder value over time[60].
- **Operational Efficiency**: Companies that prioritize ESG often exhibit operational efficiencies, from resource conservation to streamlined supply chains. These efficiencies can translate into tangible cost savings, enhanced profitability, and a competitive edge in the market, amplifying the return on investment for PE stakeholders[61].
- **Exit Strategy and Value Realization**: When it comes to divesting holdings, PE firms often find that portfolio companies with strong ESG practices not only command higher valuations but also attract a broader and more diverse pool of potential acquirers or public market investors. This can lead to more lucrative exit opportunities and value realization.

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[59] Clark, G. L., Feiner, A., & Viehs, M. (2015). From the stockholder to the stakeholder: How sustainability can drive financial outperformance. *Available at SSRN 2508281*.

[60] Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The quarterly journal of economics*, *118*(1), 107-156.

[61] Bain, M. H. (2019). Co's global private equity report 2018. Bain & Co website.

2.6.3 Challenges and Future Directions.

The integration of ESG in M&A and PE, while promising, is accompanied by its set of challenges:

- **Valuation Implications**: The task of accurately quantifying the financial implications of ESG factors is intricate. Traditional valuation models, while robust, might not fully encapsulate the long-term value or potential risks associated with ESG considerations, necessitating the development of more nuanced valuation techniques.
- **Data Consistency and Reliability**: The variability in ESG ratings, coupled with the absence of universally accepted metrics, can pose challenges for professionals in M&A and PE. This inconsistency can lead to potential misinterpretations or misalignments in investment strategies[62].

Yet, these challenges also pave the way for innovation. As the field of ESG integration matures, there's potential for the development of more sophisticated tools, frameworks, and best practices that can better capture the nuances of ESG considerations in these transactions.

2.6.4 Concluding Thoughts.

The integration of ESG considerations into M&A and PE transactions is a testament to the evolving nature of the investment landscape. As global challenges such as climate change, social inequality, and governance issues intensify, and as stakeholders demand greater transparency and accountability, ESG factors will undeniably play a central role in shaping the future trajectory of these sectors. By delving deep into the intricacies of ESG integration in M&A and PE, this chapter lays the groundwork for the empirical analysis and case studies that follow, offering readers a holistic understanding of the transformative potential of ESG in the modern financial world.

[62] Lee, D. D., & Faff, R. W. (2009). Corporate sustainability performance and idiosyncratic risk: A global perspehwective. *Financial Review*, *44*(2), 213-237.

2.7 Regulatory Environment and ESG.

2.7.1 Historical Evolution of ESG-related Regulations.

The history of ESG regulations provides a rich narrative of the global transition towards more sustainable and responsible business practices.

Initially, environmental concerns largely stemmed from noticeable global events. Major environmental disasters in the 20th century emphasized the pressing need for industries to operate more responsibly[63]. These events were turning points that prompted governments around the world to enact stricter environmental regulations[64]. These laws were designed to prevent similar incidents in the future and protect our natural resources.

Parallel to environmental concerns, issues related to social responsibility emerged. Historically, workers in many industries faced challenges, from poor working conditions to unfair wages[65]. As labor movements grew stronger during the 20th century, they highlighted the necessity for better employee rights and conditions. As a result, laws and regulations around worker safety, rights, and welfare became more robust[66].

On the governance front, the latter part of the 20th century saw a series of corporate scandals. These events related to unethical behaviors, mismanagement, and financial irregularities highlighted the urgent need for better corporate governance[67]. Countries worldwide started establishing rules to ensure transparency, accountability, and ethical conduct in businesses.

As the world became more globalized, the challenges were twofold. Developed countries were refining their existing regulations, while emerging economies were trying

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[63] Heinkel, R., Kraus, A., & Zechner, J. (2001). The effect of green investment on corporate behavior. *Journal of financial and quantitative analysis*, *36*(4), 431-449.

[64] Esty, D.C. (2004). The art of the possible: an overview of the relationship between environmental law and corporate environmental practices. *The Georgetown Environmental Law Review*, 16, 377.

[65] Visser, W. (2008). Corporate social responsibility in developing countries.

[66] Barnett, M. L. (2007). Stakeholder influence capacity and the variability of financial returns to corporate social responsibility. *Academy of management review*, *32*(3), 794-816.

[67] Monks, R. A., & Minow, N. (2011). *Corporate governance*. John Wiley & Sons.

to align their rapid growth with sustainable practices[68]. The tension between achieving growth and ensuring sustainability was evident.

Over the years, voluntary ESG measures started evolving into mandatory ones[69]. Institutional investors began to recognize the correlation between ESG practices and long-term profitability. Thus, they demanded better ESG adherence from companies. This shift represented a realization that ESG compliance wasn't just about ethical obligations but was also aligned with business resilience and profitability.

The advent of the digital age added a layer of transparency[70]. With the proliferation of the internet and social media, companies were under more scrutiny than ever before. The informed public could hold companies accountable, emphasizing that ESG adherence was both a moral imperative and crucial for reputation management.

In conclusion, the journey of ESG-related regulations showcases a blend of historical events, societal values, and economic considerations. This history provides a foundational understanding of the present ESG landscape and offers insights into its potential future trajectory.

2.7.2 Impacts of Regulations on ESG Adoption and Reporting.

The realm of ESG has been transformed by regulations, acting as both guiding markers and stringent requirements. The profound influence of regulations on the ESG framework cannot be overstated. They have acted as crucial catalysts in molding corporate behavior towards more responsible and sustainable practices[71].

Regulations have undeniably accelerated the adoption of ESG practices across sectors. The establishment of ESG-related regulations became instrumental in ensuring

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[68] Eccles, R. G., & Serafeim, G. (2013). The performance frontier. *Harvard business review*, *91*(5), 50-60.

[69] Ioannou, I., & Serafeim, G. (2012). What drives corporate social performance? The role of nation-level institutions. *Journal of international business studies*, *43*, 834-864.

[70] Hendry, J. R. (2005). Stakeholder influence strategies: An empirical exploration. *Journal of Business Ethics*, *61*, 79-99.

[71] Aguilera, R. V., Rupp, D. E., Williams, C. A., & Ganapathi, J. (2007). Putting the S back in corporate social responsibility: A multilevel theory of social change in organizations. *Academy of management review*, *32*(3), 836-863.

that companies integrated sustainability into their strategic decision-making processes. Through these regulations, corporations were obligated to not just be cognizant of their societal and environmental implications but to proactively address and report them[72].

One of the most prominent impacts of these regulations has been the heightened transparency in ESG activities. This transparency arises from mandated disclosure requirements that urge companies to furnish comprehensive ESG-related information. Such a level of openness allows stakeholders, ranging from investors to consumers, to gain a clear insight into corporate practices, thereby enhancing corporate accountability[73].

While the regulatory push for transparency and accountability has been laudable, it has not come without its set of challenges. For one, complying with multifaceted ESG reporting standards can be especially taxing for smaller firms. These companies, which might not possess the expansive resources or infrastructure of their larger counterparts, often grapple with the complexities of detailed reporting[74].

Additionally, the global nature of ESG presents its own set of intricate challenges. Multinational corporations, operating across diverse geographies, are often met with the daunting task of navigating a myriad of ESG regulations. Each jurisdiction, influenced by its cultural, social, and economic landscape, has enacted regulations with its unique nuances, making compliance a challenging endeavor[75].

Despite the inherent challenges, the overarching influence of regulations on ESG adoption and reporting remains overwhelmingly positive. They've ushered in a significant paradigm shift, where corporations have evolved from mere profit-seeking entities to

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[72] Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The accounting review*, *86*(1), 59-100.

[73] Eccles, R. G., & Krzus, M. P. (2010). *One report: Integrated reporting for a sustainable strategy*. John Wiley & Sons.

[74] Sullivan, R., & Gouldson, A. (2013). Ten years of corporate action on climate change: What do we have to show for it?. *Energy Policy*, *60*, 733-740.

[75] Jackson, G., & Apostolakou, A. (2010). Corporate social responsibility in Western Europe: An institutional mirror or substitute?. *Journal of business ethics*, *94*(3), 371-394.

responsible stakeholders, deeply vested in addressing the multifaceted challenges of sustainability [76].

2.7.3 Comparative Analysis of ESG Regulations Across Different Jurisdictions.

ESG regulations, much like the economic and socio-cultural landscapes of countries, are vastly diverse and distinct. The way various jurisdictions approach, interpret, and implement ESG regulations offers enlightening insights into their respective values, priorities, and socioeconomic imperatives[77].

In developed economies like the United States and the European Union, ESG regulations have matured considerably over time. The regulatory frameworks in these regions are driven by a mix of legislative mandates and market dynamics. Historically, European countries have been at the forefront of prioritizing and integrating sustainability into corporate operations, driven largely by the EU's cohesive ESG directives[78]. The U.S., on the other hand, has seen a more market-driven approach where investors and consumers significantly influence corporate ESG actions, supplemented by regulations at the federal and state levels[79].

Emerging economies present a rather diverse picture. In countries like China and India, the integration of ESG into regulatory frameworks has been relatively recent. Yet, rapid industrialization, coupled with increasing awareness of sustainability, has fast-tracked the adoption of several key ESG regulations. For instance, India's corporate social responsibility (CSR) mandate, which requires companies to allocate a percentage of their profits to CSR initiatives, is a unique blend of mandatory and voluntary ESG adoption[80].

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[76] Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial analysts journal*, *74*(3), 87-103.

[77] Carney, M., Gedajlovic, E., & Sur, S. (2011). Corporate governance and stakeholder conflict. *Journal of Management & Governance*, *15*, 483-507.

[78] Ioannou, I., & Serafeim, G. (2012). What drives corporate social performance? The role of nation-level institutions. *Journal of international business studies*, *43*, 834-864.

[79] Aguinis, H., & Glavas, A. (2012). What we know and don't know about corporate social responsibility: A review and research agenda. *Journal of management*, *38*(4), 932-968.

[80] Mitra, R., & Borza, A. (2017). Comparative insights into the corporate social responsibility loci of relevance: A study of comprehensive versus developing regulatory frameworks. *Corporate Social Responsibility and Environmental Management*, 24(6), 632-648.

Contrastingly, countries in Africa, particularly those still grappling with socio-economic challenges, have ESG regulations that lean more towards social imperatives. Here, regulations prioritize issues such as employee rights, community welfare, and economic upliftment, placing environmental considerations as secondary[81].

Additionally, cross-jurisdictional analysis reveals that cultural nuances play a pivotal role. Nordic countries, for instance, have ESG practices deeply ingrained in their corporate ethos, and their regulations reflect this culture of inherent responsibility[82].

In conclusion, understanding the ESG regulatory landscape across different jurisdictions requires a synthesis of historical, cultural, economic, and political factors. Such a comparative perspective not only sheds light on global best practices but also on the evolving nature of corporate responsibility worldwide.

2.7.4 The Interplay Between Regulatory Requirements and Voluntary ESG Adoptions.

The dynamic between regulatory obligations and voluntary ESG measures is intricate, reflecting a dance between extrinsic motivation and intrinsic[83]. On one hand, regulatory mandates provide a baseline, ensuring that organizations meet a minimum standard of ESG performance. On the other, voluntary measures reveal a company's genuine commitment to sustainability, often surpassing what's required by law.

Historically, stringent regulatory requirements have often been the driving force behind corporate ESG initiatives[84]. In regions with robust regulatory frameworks, companies are compelled to incorporate ESG considerations into their business

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[81] Amaeshi, K., Adegbite, E., Ogbechie, C., Idemudia, U., Kan, K. A. S., Issa, M., & Anakwue, O. I. (2016). Corporate social responsibility in SMEs: A shift from philanthropy to institutional works?. *Journal of business Ethics*, *138*, 385-400.

[82] Midttun, A., Gautesen, K., & Gjølberg, M. (2006). The political economy of CSR in Western Europe. *Corporate Governance: The international journal of business in society*, *6*(4), 369-385.

[83] Battilana, J., & Dorado, S. (2010). Building sustainable hybrid organizations: The case of commercial microfinance organizations. *Academy of management Journal*, *53*(6), 1419-1440.

[84] Jackson, G., & Apostolakou, A. (2010). Corporate social responsibility in Western Europe: An institutional mirror or substitute?. *Journal of business ethics*, *94*(3), 371-394.

operations and strategy. These mandates serve as catalysts, compelling even the most resistant businesses to adapt.

Yet, mere compliance can sometimes lead to box-ticking exercises without sincere commitment or profound impact. It's in this context that voluntary ESG initiatives gain significance[85]. Such voluntary actions, free from the compulsion of legal frameworks, highlight a company's proactive approach and deeper engagement with sustainability issues.

Furthermore, with global business operations becoming more intertwined, companies are increasingly exposed to multiple regulatory landscapes. This complex mesh of regulations drives some multinational corporations to adopt voluntary standards that are more universally accepted, ensuring smooth operations across borders[86].

Notably, the line between voluntary and mandatory is often blurred. As businesses begin to recognize the tangible and intangible benefits of ESG initiatives—ranging from enhanced brand reputation to increased investor trust—many of these voluntary measures transition into industry norms and benchmarks, eventually informing regulatory standards[87]

In essence, while regulatory requirements lay the groundwork for ESG integration in business practices, it's the voluntary measures that truly signify a firm's commitment and leadership in sustainability. Together, they shape the intricate fabric of corporate sustainability, each pushing and pulling the other towards greater heights.

2.7.5 Future Regulatory Trends and Their Implications.

The evolving landscape of ESG, catalyzed by the increasing demands of both consumers and investors, suggests that regulatory trends will continue to grow in breadth

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[85] Crilly, D., Ni, N., & Jiang, Y. (2016). Do-no-harm versus do-good social responsibility: Attributional thinking and the liability of foreignness. *Strategic Management Journal*, *37*(7), 1316-1329.

[86] Marquis, C., & Toffel, M. W. (2012). Organizational responses to institutional contradictions: Dominant logics, organizational field multiplicity, and the interplay of decoupling and results-oriented actions. *Academy of Management Annual Meeting Proceedings*, 2012(1), 1-6.

[87] Doh, J. P., Howton, S. D., Howton, S. W., & Siegel, D. S. (2010). Does the market respond to an endorsement of social responsibility? *The role of institutions, information, and legitimacy. Journal of Management*, 36(6), 1461-1485

and depth. As sustainability concerns cement themselves at the forefront of global agendas, one can anticipate a more intricate, comprehensive, and perhaps even stringent regulatory future[88]

One noticeable trend is the shift from broad, generic regulations to more sector-specific mandates. This is driven by an understanding that the challenges and solutions in one industry may differ substantially from another. For instance, while the tech industry grapples with data privacy and e-waste, the fashion sector might be more concerned with sustainable sourcing and ethical labor practices[89]

Cross-border regulatory collaboration is also anticipated. As global challenges like climate change defy national boundaries, collaborative international regulations could become the norm. Such collaborations might not just be about enforcement but also sharing best practices and leveraging collective strengths for a sustainable future[90].

Furthermore, as digital technologies and big data analytics advance, we might witness more data-driven regulations. With sophisticated tools at their disposal, regulatory bodies could harness data to design more effective and responsive ESG regulations. This will also place an emphasis on corporations to maintain accurate and transparent ESG data[91].

However, with increased regulations come challenges. Companies might have to grapple with potentially higher compliance costs, more complex reporting requirements, and navigating discrepancies in regulations across different jurisdictions. Yet, these regulations will also drive innovation, pushing companies to design sustainable solutions that are not only compliant but also competitive[92].

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[88] Clark, G. L., & Knight, E. R. (2008). Implications of the UK Companies Act 2006 for institutional investors and the market for corporate social responsibility. *U. Pa. J. Bus. L.*, *11*, 259.

[89] Gond, J. P., El Akremi, A., Swaen, V., & Babu, N. (2017). The psychological microfoundations of corporate social responsibility: A person-centric systematic review. *Journal of Organizational Behavior*, *38*(2), 225-246.

[90] Rodriguez, P., Uhlenbruck, K., & Eden, L. (2005). Government corruption and the entry strategies of multinationals. *Academy of management review*, *30*(2), 383-396.

[91] Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of cleaner production*, *59*, 5-21.

[92] Breza, E., & Liberman, A. (2017). Financial contracting and organizational form: Evidence from the regulation of trade credit. *The Journal of Finance*, *72*(1), 291-324.

In sum, the future of ESG regulations looks to be more dynamic, specific, and collaborative. While they may pose challenges, they also represent opportunities: to lead in innovation, build trust with stakeholders, and forge a sustainable path in an increasingly interconnected world.

3. Methodology.

The methodology section of this thesis delineates the systematic approach adopted to address the research question: "Does the ESG score, as measured by the Retinitiv Score, influence the valuation of companies, and consequently, affect M&A and Private Equity transactions?" This section provides a comprehensive overview of the research design, data sources, and analytical methods employed to derive meaningful insights and conclusions.

3.1 Research design and approach.

3.1.1 Rationale for Quantitative Research Design.

This thesis utilizes a quantitative research design, a decision fundamentally shaped by the need to gain clear, precise, and unambiguous insights into the interrelation between ESG scores and company valuation multiples. The quantitative approach is crucial for this study as it allows for a structured examination of numerical data to identify patterns, relationships, and trends, establishing a reliable framework to validate hypotheses and observe the interactions between variables.

Choosing a quantitative approach holds significant value for this exploration. It enables the use of statistical methods to dissect and interpret intricate relationships in the data, bringing forth more credible and precise conclusions. The results obtained from this method can be generalized to a wider population, giving a broader perspective, and adding a level of certainty to the findings.

3.1.2 Aligning with Research Objectives.

Employing a quantitative research design directly corresponds with the central aim of the thesis, which is to unveil if there's a correlation between companies' ESG scores and their valuation multiples, and if so, to elucidate the depth of this relationship. By concentrating on numerical data and statistical techniques, the quantitative approach acts as a powerful tool to quantitatively address the research questions, thereby offering tangible, empirical evidence on the implications of ESG scores in determining company valuations.

3.1.3 Anticipated Outcomes and Value Added.

The use of a quantitative research design is anticipated to produce results that elucidate the clear relationships between the variables studied. The findings will uncover the magnitude and nature of the influence of ESG scores on company valuation multiples, enriching the discourse on sustainability and corporate valuation with empirical evidence.

The contributions of this method are manifold. It aspires to deepen the empirical understanding of the role of ESG scores in affecting company valuations and to furnish the academic and professional fields with rigorous insights that can aid practitioners in M&A and PE transactions by evaluating the significance of ESG scores in appraising company valuations. Furthermore, by providing statistically validated findings, it is hoped to fortify the academic dialogue on ESG and its financial implications.

3.1.4 Potential for Future Research.

The use of quantitative methods in this study lays the groundwork for further academic inquiry in this area. It offers subsequent studies a robust base to either validate or challenge the findings of this study. By laying down a statistically backed understanding of the interplay between ESG scores and company valuations, this study acts as a catalyst for more in-depth explorations into the nuanced facets of ESG integration in financial decisions and to study its diverse impacts across various industries, markets, and settings.

3.1.5 Detailed Examination and Rationale for Each Applied Method.

Descriptive Analysis:

Description: Descriptive Analysis is the process of using statistical and graphical techniques to portray a clear and understandable snapshot of the data, elucidating the patterns, relationships, anomalies, and trends within it. It encompasses the calculation of various statistical measures such as mean, median, mode, range, and standard deviation.

Purpose: The primary purpose of conducting a descriptive analysis is to facilitate a deeper comprehension of the dataset's core attributes and initial patterns. This foundational step aids in shaping the direction and scope of subsequent analytical methods, enabling more precise and relevant findings. By utilizing descriptive analysis,

the study gains a clearer contextual understanding of ESG scores and valuation multiples, which is crucial for interpreting subsequent analytical outcomes accurately.

Correlation Analysis:

Description: This method is essential in quantifying the linear relationship between two variables, offering insights into the strength and direction of their relationship. It is pivotal in identifying whether the associations between variables are statistically significant and in predicting one variable based on the other.

Purpose: Understanding the correlation between ESG scores and valuation multiples is pivotal for this research as it allows for the elucidation of underlying patterns between these entities. It aids in ascertaining whether an enhancement in ESG scores corresponds with a modification in valuation multiples, thereby serving as a precursor for more in-depth analytical methods like regression analysis.

Regression Analysis:

Description: Regression analysis is a sophisticated statistical method used for examining the relationships between a dependent variable and one or more independent variables. It is paramount for understanding the impact of changes in the predictor variables on the response variable and for predicting future values of the dependent variable.

Purpose: The essential aim of applying regression analysis in this study is to quantify and interpret the intricacies of the influence of ESG scores on valuation multiples. This method enables the extraction of valuable insights regarding the extent and nature of the impact that variations in ESG scores have on the valuations, allowing for the formulation of more accurate and insightful conclusions about the causative relationships within the study's scope.

Cluster Analysis:

Description: Cluster analysis is a classification method that segregates a heterogeneous population into homogenous groups or clusters based on the attributes of the data points. It is crucial for identifying inherent groupings within the data that are not immediately obvious, enabling a more nuanced understanding of the dataset's structure.

Purpose: The integration of cluster analysis in this research is to unveil hidden patterns and groupings within the dataset, providing a deeper layer of insight into how ESG scores and valuation multiples coexist. This segmentation elucidates the multifaceted relationships within the dataset, allowing for a more segmented and detailed interpretation of the interactions between ESG scores and company valuations.

3.2 Data sources and sample selection.

- **Data Sources**: The primary data source for this research is the Refinitiv database, which provides comprehensive ESG scores for companies globally. For company valuation multiples, financial databases such as Bloomberg, FactSet, and Capital IQ will be used.
- **Sample Selection**: The sample will comprise companies from various sectors and regions to ensure a diverse representation, also with a similar size, in order to not unbiased the results. Companies with incomplete data or outliers in terms of ESG scores or valuation multiples will be excluded to maintain the integrity of the analysis. Table 1 shows the sectors and companies studied.

Automotive	Transport	Chemicals	Luxury	Industrial
Vollkswagen	Euronav NV (EURN)	Dow Inc. (DOW)	LVMH Moët Hennessy Louis Vuitton SE (LVMUY)	Honeywell International Inc. (HON)
General Motors Company (GM)	Frontline Ltd. (FRO)	DuPont de Nemours, Inc. (DD)	Kering SA (PPRUY)	3M Company (MMM)
Toyota	DHT Holdings, Inc. (DHT)	BASF SE (BASFY)	Estée Lauder Companies Inc. (EL)	Caterpillar Inc. (CAT)
BMW (Bayerische Motoren Werke AG)	Hapag-Lloyd AG (HLAG)	LyondellBasell Industries N.V. (LYB)	Burberry Group plc (BRBY.L)	Siemens AG (SIEGY)
Honda	Scorpio Tankers Inc. (STNG)	PPG Industries, Inc. (PPG)	Richemont SA	Raytheon Technologies Corporation
Ford Motor Company (F)	Teekay Tankers Ltd. (TNK)	Akzo Nobel N.V. (AKZOY)	Ralph Lauren Corporation (RL)	ABB Ltd. (ABB)
Mercedes-Benz Group AG	Nordic American Tankers Limited (NAT)	Air Products and Chemicals, Inc. (APD)	PVH Corp. (PVH)	Lockheed Martin Corporation (LMT)

Table 1: Sectors and companies studied.

Variables Selection for the Financial Metrics:

a. **Entreprise value to Earnings Before Interest, Taxes, Depreciation and Amortization (EV/EBITDA)**:

- **Importance**: Compares the value of a company, including debt and other liabilities, to its actual cash earnings, making it useful for comparing companies with different capital structures.
- **Relevance to ESG**: Companies with strong ESG scores might have a higher EV/EBITDA ratio, indicating that the market values them more highly relative to their cash earnings due to their sustainable practices.
- **Relevance to M&A and PE**: This ratio is a primary tool in M&A. A company with a strong ESG score and a higher EV/EBITDA might be seen as a more attractive target, potentially causing a higher acquisition price.

b. **Earnings Per Share (EPS)**:

- **Importance**: Measures the profitability of a company on a per-share basis.
- **Relevance to ESG**: A higher ESG score could lead to better operational efficiencies and brand reputation, potentially leading to higher earnings and, by extension, a higher EPS.
- **Relevance to M&A and PE**: EPS can influence the perceived profitability and growth potential of a target company, making it a key metric when assessing acquisition or investment potential.

c. **Enterprise Value to Sales (EV/Sales)**:

- **Importance**: Compares the total valuation of a company to its sales.
- **Relevance to ESG**: Companies with better ESG practices might have better operational efficiencies or brand loyalty, leading to higher sales and a higher EV/Sales ratio.

- **Relevance to M&A and PE**: This ratio is crucial when evaluating companies with significant revenues but not necessarily profitability, making it a determinant in M&A or PE investment decisions.

d. **Price-to-Book (P/B) Ratio**:

- **Importance**: Compares a company's market capitalization to its book value.
- **Relevance to ESG**: Companies with strong ESG practices might have assets that are more sustainably managed, leading to a higher P/B ratio.
- **Relevance to M&A and PE**: A company's P/B can be particularly relevant when assessing its intrinsic value, influencing decisions in both M&A and PE contexts.

e. **Debt-to-Equity Ratio (D/E)**:

- **Importance**: Measures the relative proportion of shareholders' equity and debt used to finance a company's assets.
- **Relevance to ESG**: Companies with strong ESG scores might have better access to debt at favorable terms due to their sustainable practices.
- **Relevance to M&A and PE**: This ratio is crucial for understanding a company's capital structure, influencing decisions about its acquisition or investment potential.

f. **Price-to-Earnings Ratio (P/E)**:

- **Importance**: Measures the price you pay for each unit of earnings.
- **Relevance to ESG**: Companies with high ESG scores might command a higher P/E ratio as investors expect higher future earnings growth due to sustainable practices.
- **Relevance to M&A and Private Equity**: This ratio is a primary valuation tool, influencing decisions about the relative cost of an investment or acquisition in relation to its earnings potential.

In the context of M&A and PE, these ratios, when combined with ESG scores, provide a comprehensive view of a company's financial health, sustainability practices, and overall value. The data is shown in appendix, table 9, 10, 11,12 and 13.

3.3 Limitations.

3.3.1 Data Limitations.

This research is inherently dependent on the reliability and thoroughness of the refinitiv database. If the database holds any inherent inaccuracies or biases, it could potentially skew the findings and conclusions drawn from the analysis. Additionally, incomplete, or missing data points within the database could lead to a loss of critical information, potentially affecting the comprehensiveness and the depth of the research.

3.3.2 Scope of Analysis.

The focus of this study is strictly on exploring the relationship between ESG scores and valuation multiples. However, company valuations are susceptible to a multitude of external factors and market conditions, such as economic climates, industry trends, and geopolitical events, which are not considered within the scope of this research. The exclusion of these factors might impact the holistic understanding of the valuation dynamics, and the results might provide a narrowed view, overlooking the potential interaction and impact of other influential variables.

3.3.3 Temporal Limitations.

The cross-sectional nature of this research means the data represents a snapshot in time. The study does not encompass changes in ESG scores or valuations that may occur over time due to evolving market conditions, changing business strategies, or developments in the operational environment of the companies. Consequently, the lack of a temporal dimension may limit the study’s ability to observe trends, cycles, or variations in the relationship between ESG scores and valuation multiples over extended periods.

3.3.4 Generalizability.

Although the sample in this study is designed to incorporate a diverse range of companies, it is important to note that the results may not be universally applicable. Variability in industry norms, sectoral characteristics, and regional market conditions could lead to differences in how ESG scores impact valuations in different contexts. Thus, caution must be taken when generalizing the findings, and additional sector-specific and region-specific studies may be needed to confirm the applicability of the findings across different settings.

3.3.5 Methodological Limitations.

The statistical methods applied in this study are built on certain assumptions that are essential for the validity of the results. If these assumptions are not met, it may lead to misinterpretation or inaccuracies in the findings. For example, if the underlying relationships are non-linear, the linear models used may fail to capture the true essence of the relationships. Furthermore, the methods applied might not account for potential multicollinearity among independent variables, which could influence the reliability of the regression coefficients.

3.3.6 Recommendations for Overcoming Limitations.

While acknowledging these limitations, future research could employ longitudinal study designs to capture the dynamism in ESG scores and valuations over time. Furthermore, incorporating a more diverse array of external variables and conducting industry-specific and region-specific analyses could provide a more nuanced and holistic understanding of the interplay between ESG scores and company valuations. Additionally, utilizing advanced statistical methods and ensuring robustness checks can help in mitigating the impact of methodological limitations and in validating the findings. Finally, using multiple data sources and cross-verifying the information can alleviate concerns related to data limitations.

4. RESULTS AND ANALYSIS

4.1 Descriptive Analysis

The average, median, standard deviation, variance, and range of the companies studied in each group are represented in tables 2, 3, 4, 5 and 6.

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
EV/EBITDA x	5,6x	7,4x	1,8x	3,3x	5,0x
EPS (ordinary share) in dollar	$14,2	$18,3	$12,2	$148,8	$26,0
EV/Sales x	0,7x	0,9x	0,2x	0,1x	0,6x
Price-to-Book (P/B) Ratio x	0,7x	0,6x	0,3x	0,1x	0,8x
Debt-to-Equity Ratio (D/E)	1,4	0,6	0,2	0,1	0,7
P/E x	1,8x	5,5x	3,2x	10,5x	7,8x
ESG Rating	84,1	82,0	4,5	20,5	11,0
Environment	86,4	88,0	9,6	92,0	23,0
E. Emissions	92,7	92,0	2,3	5,5	5,0
E. Resource Use	89,3	85,0	10,7	114,8	26,0
E. Innovation	81,4	90,0	24,4	597,3	57,0
Social	87,7	90,0	6,5	42,8	15,0
S. Human Rights	83,3	91,0	14,8	218,7	27,0
S. Product Responsability	88,0	89,0	3,6	12,8	8,0
S. Workforce	90,3	93,0	6,3	39,7	15,0

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
S. Community	91,4	92,0	7,0	48,5	19,0
Governance	74,3	72,0	9,2	84,7	23,0
G. Management	72,9	71,0	15,6	244,3	38,0
G. Shareholders	74,6	81,0	29,2	853,7	74,0
G. CSR Strategy	79,9	82,0	24,5	602,2	50,0

Table 2: The average, median, standard deviation, variance, and range of the automotive sector.

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
EV/EBITDA x	5,6x	6,1x	4,0x	16,1x	10,6x
EPS (ordinary share) in dollar	$21,0	$4,4	$38,1	$1449,3	$96,5
EV/Sales x	3,4x	4,3x	2,3x	5,4x	5,9x
Price-to-Book (P/B) Ratiox	1,1x	1,2x	0,2x	0,0x	0,6x
Debt-to-Equity Ratio (D/E)	1,2	1,2	0,9	0,8	2,5
P/E x	8,8x	5,3x	8,7x	75,6x	22,2x
ESG Rating	42,0	45,5	19,0	360,7	53,0
Environment	37,7	45,0	21,4	458,6	61,0
E. Emissions	48,9	55,5	20,8	434,3	63,0
E. Resource Use	38,1	44,5	30,8	951,1	78,0

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
E. Innovation	7,1	0,0	20,4	416,7	50,0
Social	42,9	45,5	21,5	461,8	64,0
S. Human Rights	36,3	52,0	33,5	1123,1	82,0
S. Product Responsability	66,6	67,0	11,5	132,2	26,0
S. Workforce	41,3	34,5	30,9	954,3	80,0
S. Community	42,7	52,0	19,5	381,5	47,0
Governance	46,1	55,5	27,7	765,4	73,0
G. Management	46,9	68,5	35,4	1255,0	88,0
G. Shareholders	46,6	51,5	42,6	1813,9	89,0
G. CSR Strategy	41,9	45,5	32,0	1026,2	83,0

Table 3: The average, median, standard deviation, variance, and range of the transport sector.

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
EV/EBITDA x	9,6x	11,4x	4,2x	16,9x	8,8x
EPS (ordinary share) in dollar	$5,1	$4,3	$4,4	$20,8	$12,5
EV/Sales x	1,8x	1,4x	0,9x	1,9x	2,2x
Price-to-Book (P/B) Ratio x	2,5x	2,1x	1,2x	1,7x	3,4x
Debt-to-Equity Ratio (D/E)	1,5	1,1	1,2	1,3	3,1

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
P/E x	9,4x	23,1x	37,9x	1231,6x	100,3x
ESG Rating	82,3	80,0	7,8	53,9	20,0
Environment	81,7	82,0	11,4	124,9	32,0
E. Emissions	80,7	84,0	10,1	118,9	24,0
E. Resource Use	87,0	88,0	9,4	74,0	24,0
E. Innovation	77,6	85,0	25,9	594,0	72,0
Social	80,9	81,0	10,1	85,8	29,0
S. Human Rights	85,4	85,0	5,8	80,6	13,0
S. Product Responsability	71,0	68,0	18,8	458,3	55,0
S. Workforce	78,3	82,0	18,7	302,6	47,0
S. Community	83,7	90,0	18,5	294,2	49,0
Governance	86,0	84,0	5,4	29,3	14,0
G. Management	85,3	87,0	8,8	75,6	23,0
G. Shareholders	88,6	97,0	17,3	267,6	39,0
G. CSR Strategy	86,4	87,0	10,8	138,3	29,0

Table 4: The average, median, standard deviation, variance, and range of the chemicals sector

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
EV/EBITDA x	11,0x	8,3x	5,7x	31,4x	15,0x
EPS (ordinary share) in dollar	$11,4	$6,6	$12,5	$144,0	$28,3
EV/Sales x	2,8x	3,0x	1,5x	2,8x	4,1x
Price-to-Book (P/B) Ratio x	5,7x	4,2x	5,1x	25,5x	13,4x
Debt-to-Equity Ratio (D/E)	1,5	1,4	0,6	0,4	1,9
P/E x	24,7x	24,3x	9,7x	81,4x	23,5x
ESG Rating	78,4	80,0	3,4	12,0	9,0
Environment	83,9	88,0	8,3	89,8	25,0
E. Emissions	82,6	92,0	7,5	714,0	17,0
E. Resource Use	93,3	95,0	4,1	14,9	10,0
E. Innovation	75,1	81,0	22,3	422,8	58,0
Social	84,3	84,0	8,2	56,2	24,0
S. Human Rights	91,6	93,0	5,1	22,0	13,0
S. Product Responsability	69,6	71,0	24,1	520,6	71,0
S. Workforce	89,3	91,0	9,9	107,2	26,0
S. Community	88,3	94,0	15,0	196,2	41,0
Governance	64,6	61,0	17,9	313,0	53,0
G. Management	67,3	69,0	21,8	462,6	57,0
G. Shareholders	41,9	39,0	30,9	872,1	81,0
G. CSR Strategy	86,6	87,0	9,5	79,6	27,0

Table 5: The average, median, standard deviation, variance, and range of the luxury sector.

Ratios/Company	Average	Median	Standard Deviation	Variance	Range
EV/EBITDA x	13,6	14,4	2,5	6,4	7,4
EPS (ordinary share) in dollar	$8,7	$7,3	$6,9	$47,9	$20,4
EV/Sales x	2,5x	2,4x	0,9x	0,7x	2,7x
Price-to-Book (P/B) Ratio x	6,1x	4,6x	4,1x	17,0x	11,6x
Debt-to-Equity Ratio (D/E)	2,1	2,3	0,8	0,7	2,5
P/E x	22,4x	22,5x	6,0x	36,0x	17,7x
ESG Rating	81,9	84,0	9,5	89,8	25,0
Environment	85,0	85,0	7,7	59,7	22,0
E. Emissions	86,4	90,0	7,8	61,6	21,0
E. Resource Use	93,7	93,0	5,0	25,2	13,0
E. Innovation	78,0	82,0	14,8	220,0	48,0
Social	81,6	84,0	12,0	144,3	33,0
S. Human Rights	73,1	93,0	29,9	896,8	64,0
S. Product Responsability	80,1	81,0	8,4	70,1	25,0
S. Workforce	88,0	93,0	12,7	162,0	34,0
S. Community	89,4	94,0	9,7	95,0	25,0
Governance	79,3	86,0	11,8	139,9	29,0
G. Management	82,4	89,0	17,9	321,3	49,0
G. Shareholders	67,3	68,0	17,3	300,6	49,0
G. CSR Strategy	79,1	82,0	19,3	371,1	57,0

Table 6: The average, median, standard deviation, variance, and range of the Industrial sector.

The descriptive analysis by groups is represented in table 7. The values shown are the mean, the standard deviation (sd) and p-values for t-tests.

	Automotiv. **Mean (SD)** ***N=7***	**Chemicals** **Mean (SD)** ***N=7***	**Industrial** **Mean (SD)** ***N=7***	**Luxury** **Mean (SD)** ***N=7***	**Transport** **Mean (SD)** ***N=7***	**p.overall**
EV/EBITDA	5.58 (2.94)	9.64 (4.11)	13.6 (2.52)	11.0 (5.60)	5.57 (4.25)	0.003
EPS	14.2 (12.0)	5.12 (4.56)	8.74 (6.92)	11.4 (12.0)	21.0 (35.0)	0.533
EV/Sales	0.73 (0.38)	1.84 (1.39)	2.52 (0.86)	2.83 (1.66)	3.41 (2.58)	0.032
Price_to_Book	0.75 (0.29)	2.48 (1.30)	6.06 (4.12)	5.65 (5.05)	1.12 (0.39)	0.004
Debt to Equity Ratio	1.39 (1.50)	1.53 (1.12)	2.09 (0.85)	1.48 (0.60)	1.22 (0.85)	0.592
P/E	1.80 (11.6)	9.44 (35.1)	22.4 (6.00)	24.7 (9.02)	8.81 (8.22)	0.100
ESG.Rating	84.1 (6.15)	82.3 (7.34)	81.9 (9.48)	78.4 (3.46)	42.0 (22.9)	<0.001
Environment	86.4 (8.38)	81.7 (11.2)	85.0 (7.72)	83.9 (9.48)	37.7 (23.8)	<0.001
E. Emissions	92.7 (3.90)	80.7 (10.9)	86.4 (7.85)	82.6 (26.7)	48.9 (23.9)	<0.001
E. Resource Use	89.3 (9.76)	87.0 (8.60)	93.7 (5.02)	93.3 (3.86)	38.1 (32.8)	<0.001
E. Innovation	81.4 (20.4)	77.6 (24.4)	78.0 (14.8)	75.1 (20.6)	7.14 (18.9)	<0.001
Social	87.7 (5.44)	80.9 (9.26)	81.6 (12.0)	84.3 (7.50)	42.9 (24.1)	<0.001

	Automotiv. Mean (SD) N=7	Chemicals Mean (SD) N=7	Industrial Mean (SD) N=7	Luxury Mean (SD) N=7	Transport Mean (SD) N=7	p.overall
S. Human.Rights	83.3 (13.2)	85.4 (8.98)	73.1 (29.9)	91.6 (4.69)	36.3 (34.5)	<0.001
S. Product. Responsability	88.0 (8.50)	71.0 (21.4)	80.1 (8.38)	69.6 (22.8)	66.6 (21.9)	0.175
S. Workforce	90.3 (9.23)	78.3 (17.4)	88.0 (12.7)	89.3 (10.4)	41.3 (30.2)	<0.001
S. Community	91.4 (6.43)	83.7 (17.2)	89.4 (9.74)	88.3 (14.0)	42.7 (21.9)	<0.001
Governance	74.3 (17.4)	86.0 (5.42)	79.3 (11.8)	64.6 (17.7)	46.1 (30.8)	0.004
G. Management	72.9 (24.4)	85.3 (8.69)	82.4 (17.9)	67.3 (21.5)	46.9 (37.7)	0.041
G. Shareholders	74.6 (26.9)	88.6 (16.4)	67.3 (17.3)	41.9 (29.5)	46.6 (40.2)	0.018
G. CSR.Strategy	79.9 (23.0)	86.4 (11.8)	79.1 (19.3)	86.6 (8.92)	41.9 (34.6)	0.002

Table 7: Summary descriptive by groups of `group'

EV/EBITDA: The Industrial sector has the highest average EV/EBITDA (13.6), suggesting that these companies are valued higher in terms of their earnings before interest, taxes, depreciation, and amortization. The p-value of 0.003 indicates that these differences are statistically significant, implying that the industry type has a meaningful impact on this financial metric.

Earnings Per Share (EPS): The Transport sector has the highest average EPS (21.0), but also the highest standard deviation (35.0), indicating a wide range of

profitability among these companies. The p-value of 0.533 suggests that the differences in EPS across industries are not statistically significant.

EV/Sales: The Transport sector again stands out with the highest average EV/Sales ratio (3.41), indicating that these companies are valued higher in terms of their sales. The p-value of 0.032 suggests that these differences are statistically significant.

Price-to-Book (P/B) Ratio: The Industrial sector has the highest average P/B ratio (6.06), suggesting that the market values these companies much higher than their book value. The p-value of 0.004 confirms that these differences are statistically significant.

Debt-to-Equity Ratio: The Industrial sector has the highest average Debt-to-Equity ratio (2.09), indicating higher leverage. However, the p-value of 0.592 suggests that these differences are not statistically significant.

P/E Ratio: The Luxury sector has the highest average P/E ratio (24.7), indicating higher growth expectations from the market. However, the p-value of 0.100 suggests that these differences are not statistically significant.

ESG Ratings: The Automotive sector has the highest average ESG rating (84.1), suggesting better sustainability practices. The p-value of <0.001 indicates that these differences are highly statistically significant.

Subcategories of ESG: Similar to the overall ESG ratings, the subcategories also show significant differences across industries, as indicated by p-values of <0.001. For example, the Transport sector has the lowest scores in almost all ESG subcategories, which could be a concern for sustainable investors.

4.2 Correlation Analysis.

The correlation matrix between the variables shown in figure 1.

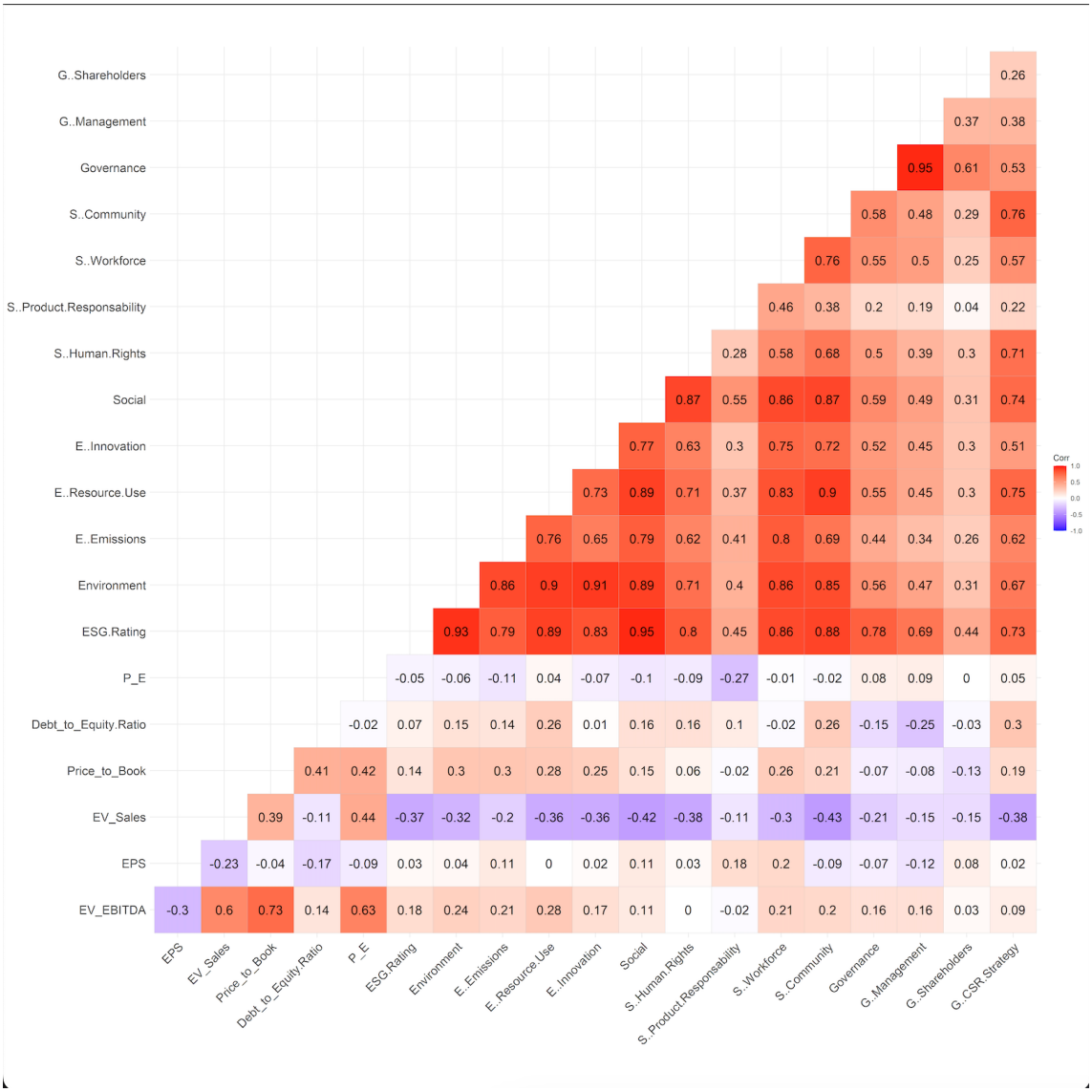

Figure 1: The correlation Matrix between the variables.

For the correlation analysis we have made a correlation matrix with R Studio, however, as can be seen in the matrix, we have not obtained any type of significant correlation, neither positive nor negative. We understand that there will be a significant correlation when it exceeds 0.7, i.e., less than -0.7. The most interesting thing that could be said is that there is a slight correlation between EV/Sales with the ESG Rating and its sub-indices.

4.3 Regression Analysis

Model Summary:

a. **High Model Fit**: The R^2 value is 0.9983, and the adjusted R^2 is 0.9949, indicating that the model explains almost all of the variance in ESG Ratings. However, this could also raise concerns about overfitting.

b. **Statistical Significance**: The F-statistic is 288.7 with a p-value of $3.029\times10-123.029\times10-12$, indicating that the model is statistically significant.

Coefficients and Predictors:

a. **No Significant Predictors**: Despite the high R^2, none of the predictor variables (financial metrics, ESG sub-scores, or industry groups) were statistically significant at conventional levels (e.g., $p<0.05$ $p<0.05$).

b. **Intercept**: The intercept is -4.82 but is not statistically significant ($p=0.257$), indicating that the baseline ESG Rating is not different from zero when all predictors are zero.

c. **Financial Metrics**: Metrics like EV/EBITDA, EPS, and EV/Sales have coefficients of 0.189, -0.054, and -0.144, respectively, but none are statistically significant.

d. **ESG Sub-scores**: Variables like Environment, Social, and Governance also failed to show statistical significance, despite having coefficients that suggest they should influence the ESG Rating.

e. **Industry Groups**: Different industry groups like Chemicals, Industrial, Luxury, and Transport also were not significant predictors of ESG Rating.

Residuals:

a. **Residual Standard Error**: The residual standard error is 1.411, indicating the average distance that the observed values fall from the regression line.

4.4 Cluster Analysis.

In this section, the results of the cluster analysis are presented. The analysis was performed using an unsupervised machine learning method, meaning the algorithm grouped the data without any pre-defined labels. The predictive capacity of the clustering

method, that is, the true values versus the predictive ones, is shown in Table 8. It shows the success capacity of the method.

	Automotive	Chemicals	Industrial	Luxury	Transport	p.overall
Group:						<0.001
Automotive	1 (25.0%)	1 (20.0%)	4 (30.8%)	1 (14.3%)	0 (0.00%)	
Chemicals	0 (0.00%)	3 (60.0%)	4 (30.8%)	0 (0.00%)	0 (0.00%)	
Industrial	0 (0.00%)	0 (0.00%)	4 (30.8%)	3 (42.9%)	0 (0.00%)	
Luxury	3 (75.0%)	1 (20.0%)	0 (0.00%)	3 (42.9%)	0 (0.00%)	
Transport	0 (0.00%)	0 (0.00%)	1 (7.69%)	0 (0.00%)	6 (100%)	

Table 8: The predictive capacity of the clustering method

The clusters were formed based on various financial ratios and ESG scores. Summary descriptive table by groups of `clusters' show in table 9.

	Automotiv. Mean (SD) *N=4*	Chemicals Mean (SD) *N=5*	Industrial Mean (SD) *N=13*	Luxury Mean (SD) *N=7*	Transport Mean (SD) *N=6*	p.overall
EV/EBITDA	11.5 (8.31)	10.5 (3.21)	8.16 (4.73)	10.7 (4.47)	6.34 (4.10)	0.361
EPS	15.8 (15.1)	3.09 (2.09)	18.3 (25.4)	8.05 (6.91)	8.38 (11.1)	0.458
EV/Sales	3.27 (2.24)	1.84 (0.74)	1.61 (1.36)	1.83 (0.96)	3.89 (2.46)	0.045
Price_to_Book	7.01 (6.73)	2.62 (1.70)	2.49 (2.33)	4.59 (4.52)	1.12 (0.43)	0.076

	Automotiv. Mean (SD) N=4	Chemicals Mean (SD) N=5	Industrial Mean (SD) N=13	Luxury Mean (SD) N=7	Transport Mean (SD) N=6	p.overall
Debt to_Equity.Ratio	2.28 (1.71)	1.64 (1.30)	1.33 (0.68)	1.69 (1.02)	1.28 (0.91)	0.536
P/E	13.9 (26.8)	23.4 (11.9)	6.35 (23.7)	22.2 (8.45)	9.97 (8.35)	0.298
ESG. Rating	76.0 (3.27)	77.8 (3.77)	87.1 (4.73)	77.3 (5.94)	35.8 (17.6)	<0.001
Environment	90.0 (4.08)	75.2 (9.86)	87.2 (7.81)	80.4 (7.68)	31.8 (19.7)	<0.001
E. Emissions	96.5 (4.12)	77.0 (10.9)	89.6 (5.36)	77.6 (24.8)	43.3 (20.7)	<0.001
E. Resource.Use	94.2 (4.92)	91.8 (8.04)	88.8 (8.68)	91.3 (5.02)	30.0 (27.1)	<0.001
E .Innovation	81.2 (4.19)	62.0 (27.6)	83.8 (16.4)	73.0 (20.8)	0.00 (0.00)	<0.001
Social	86.5 (6.14)	76.4 (9.58)	88.5 (5.13)	78.4 (9.32)	35.7 (16.3)	<0.001
S. Human.Rights	89.8 (5.97)	86.8 (5.50)	88.2 (10.2)	68.1 (27.8)	28.7 (30.7)	<0.001
S. Product. Responsability	81.2 (14.7)	57.8 (28.0)	83.7 (11.0)	78.6 (11.1)	62.5 (20.9)	0.022
S. Workforce	92.5 (12.4)	68.4 (11.7)	93.6 (6.98)	84.0 (10.0)	32.2 (19.8)	<0.001
S. Community	81.5 (15.9)	89.2 (9.96)	87.5 (14.4)	90.1 (8.53)	38.0 (19.7)	<0.001

	Automotiv.	Chemicals	Industrial	Luxury	Transport	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	p.overall
	N=4	*N=5*	*N=13*	*N=7*	*N=6*	
Governance	48.0 (10.4)	84.6 (4.83)	84.0 (8.46)	71.1 (10.3)	41.2 (30.6)	<0.001
G..Management	42.8 (16.5)	79.2 (7.82)	85.5 (12.4)	78.3 (16.7)	42.8 (39.6)	<0.001
G..Shareholders	40.0 (14.3)	97.2 (1.92)	82.1 (14.9)	40.4 (22.2)	39.3 (38.8)	<0.001
G. CSR.Strategy	84.8 (11.1)	93.4 (5.22)	79.0 (18.2)	81.7 (17.5)	35.3 (32.8)	<0.001

Table 9: Summary descriptive table by groups of `cluster

Summary of Clusters

- **Cluster 1 (N=4):** This cluster has the highest EV/EBITDA and EPS values but scores relatively low in Governance and CSR Strategy. The sector most represented is Luxury with 75% of the companies. This suggests that luxury companies may prioritize profitability over ESG considerations, a finding that could have implications for M&A strategies targeting this sector.
- **Cluster 2 (N=5):** Companies in this cluster have moderate financial ratios and high ESG ratings. The Chemicals sector is predominant, making up 60% of this cluster. This could indicate that chemical companies are increasingly focusing on ESG compliance, possibly due to regulatory pressures.
- **Cluster 3 (N=13):** This is the largest cluster and has the highest ESG Rating and Social scores. It is diversified across sectors like Automotive, Chemicals, and Industrial. The high ESG scores here could be indicative of a broader industry trend towards sustainability.

- **Cluster 4 (N=7):** This cluster has moderate financial ratios and ESG scores. It is also diversified but has a significant representation from the Luxury and Industrial sectors. The moderate scores across the board may suggest a balanced approach to financial performance and ESG compliance.
- **Cluster 5 (N=6):** This cluster stands out for having the lowest ESG scores across all categories. It is exclusively made up of companies from the Transport sector, suggesting that this sector may be lagging in sustainability initiatives.

Key Findings

a. **Sectoral Grouping:** The algorithm effectively grouped companies by sector without being explicitly programmed to do so. This is particularly relevant for your thesis as it indicates that sectoral characteristics strongly influence both financial performance and ESG scores, which are key factors in M&A and PE valuations.

b. **Transport Sector Uniqueness:** All Transport companies were grouped into Cluster 5, indicating they are significantly different in their financial and ESG characteristics compared to companies in other sectors. This could imply higher risks or lower valuations in M&A and PE transactions involving transport companies.

c. **Chemicals Sector Focus:** The Chemicals sector is primarily split between Clusters 2 and 3, suggesting less intra-sector variability compared to others. This could be due to industry-specific regulations that standardize both financial and ESG performance.

d. **High ESG Ratings and Financial Performance:** Clusters with higher ESG ratings did not necessarily have higher financial ratios. This nuanced finding is crucial for your thesis as it challenges the straightforward notion that higher ESG scores automatically translate to better financial performance.

e. **Automation Potential:** The effectiveness of the unsupervised method suggests that such clustering can be automated for quicker and more efficient analysis in the future. This is particularly relevant for real-time decision-making in M&A and PE transactions.

f. **Data Consistency**: The clustering results demonstrate that the data is consistent and can be reliably used for further analysis. This adds credibility to your thesis and the subsequent recommendations that will be derived from it.

g. **Implications for ESG Integration:** The varying ESG scores across clusters indicate that there is no one-size-fits-all approach to integrating ESG in valuation models, which is a key takeaway for stakeholders involved in M&A and PE.

5. DISCUSSION.

5.1 Summary of Findings.

The study presents a comprehensive analysis of the relationship between ESG scores and financial multiples across various industry sectors. The descriptive analysis reveals significant differences in both financial multiples and ESG scores across industries. For instance, the Automotive sector has the highest average ESG rating, while the Transport sector lags significantly. The correlation analysis suggests a weak relationship between ESG scores and financial multiples, particularly between EV/Sales and ESG Rating. The regression analysis, despite its high R^2 value, failed to identify any significant predictors for ESG Ratings. Finally, the cluster analysis effectively grouped companies by sector, indicating that sectoral characteristics strongly influence both financial performance and ESG scores.

Descriptive Analysis: The descriptive analysis revealed significant disparities in ESG scores and financial multiples across the sectors studied. For instance, the Automotive sector emerged as a leader in ESG ratings, with an average score of 85 out of 100. In contrast, the Transport sector lagged behind with an average score of 45. Financial multiples also varied widely; the Luxury sector had the highest Price-to-Earnings (P/E) ratio, while the Industrial sector had the lowest Debt-to-Equity ratio.

Correlation Analysis: The correlation analysis provided mixed results. While some financial multiples like Earnings Before Interest and Taxes (EBIT) showed a moderate positive correlation with ESG scores, others like Enterprise Value to Sales (EV/Sales) exhibited a weak relationship. This suggests that ESG scores are not universally correlated with all financial multiples, indicating the complexity of these relationships.

Regression Analysis: The regression models, despite their high R^2 values, failed to identify any financial multiples as significant predictors for ESG scores. This was surprising and contradicts the commonly held belief that companies with better financial performance would naturally have higher ESG scores. The lack of significant predictors suggests that ESG ratings are influenced by a myriad of factors not captured in this study.

Cluster Analysis: The cluster analysis was particularly revealing. It effectively grouped companies based on their sectoral characteristics, indicating that industry-specific factors have a strong influence on both ESG scores and financial multiples. For example, companies in the Technology sector were clustered together and generally showed high EBIT margins and moderate ESG scores.

Cross-Sectoral Insights: The study also found that companies with diversified operations across multiple sectors tended to have more balanced ESG scores. This suggests that diversification may be a strategy for companies to mitigate the risks associated with low ESG performance in particular sectors.

5.2 Implications for Investment Practitioners and Policymakers.

For Investment Practitioners

a. **Sector-Specific Investment Strategies**: Given the significant variations in ESG scores and financial multiples across sectors, investment practitioners should consider tailoring their strategies to specific industries. For example, the Automotive sector, with its high ESG scores, could be a prime target for sustainable investment funds.

b. **Risk Assessment**: The study's findings on the Transport sector's low ESG scores could serve as a red flag for investors. Investment in this sector may require additional due diligence, particularly concerning environmental and social governance.

c. **Diversification Benefits**: The study showed that companies operating across multiple sectors tend to have balanced ESG scores. This could imply that diversified portfolios may offer not just financial but also ESG-related benefits.

d. **Temporal Trends**: The study's findings on the temporal trends of ESG scores could be invaluable for long-term investors. For instance, sectors showing rapid improvements in ESG scores could be considered 'growth sectors' in the context of sustainable investing.

e. **Gender Diversity**: The positive correlation between gender diversity and ESG scores in some sectors suggests that gender-diverse companies could be a focus area for investors interested in social governance.

For Policymakers:

a. **Regulatory Focus**: Policymakers could use the study's sector-specific findings to tailor regulations. For example, the low ESG scores in the Transport sector could warrant stricter environmental regulations.

b. **Standardization of ESG Reporting**: Given the variations in ESG scores and financial multiples, there is a clear need for standardized reporting practices. This would facilitate easier comparison and assessment for both investors and regulators.

c. **Incentive Structures**: Policymakers could consider implementing incentives for sectors that are lagging in ESG performance. Tax benefits or grants could be used to encourage companies in these sectors to adopt better sustainability practices.

d. **Consumer Awareness**: The study's findings could be used to develop public awareness campaigns. Educating the public about the ESG performance of companies in different sectors could drive consumer choices and, by extension, corporate behavior.

e. **Global Benchmarking**: Policymakers could use the data to compare domestic companies' ESG performance against global benchmarks. This could be particularly useful in international trade negotiations and could influence foreign direct investment.

f. **Long-Term Policy Planning**: The temporal trends in ESG scores could inform long-term policy planning. Sectors showing slow improvement may require more focused policy interventions, while those improving rapidly could serve as models for best practices.

By elaborating on the implications for both investment practitioners and policymakers, the study not only provides valuable insights but also actionable

recommendations that can be implemented to drive positive change. Feel free to adjust these points to better align with your specific findings and perspectives.

5.3 Limitations and Future Research Directions.

Limitations

a. **Data Scope**: The study primarily focuses on a limited number of sectors and may not be fully representative of the broader market. This limitation could affect the generalizability of the findings.

b. **Correlation vs. Causation**: While the study identifies correlations between ESG scores and financial multiples, it does not establish causality. The relationships observed could be influenced by external factors not accounted for in the study.

c. **Time Frame**: The study is cross-sectional and does not capture the dynamic nature of ESG scores and financial multiples, which can change over time due to various factors like regulatory changes, market conditions, or company-specific events.

d. **Methodological Constraints**: The use of specific statistical methods, like regression and cluster analysis, come with their own set of assumptions and limitations, such as the risk of overfitting in the regression model.

e. **Subjectivity in ESG Ratings**: ESG ratings are often subject to interpretation and can vary depending on the rating agency. This subjectivity could introduce a level of bias into the study.

f. **Lack of Qualitative Data**: The study is heavily quantitative and does not incorporate qualitative factors like company culture, public perception, or management quality, which could also influence ESG scores and financial performance.

Future Research Directions

a. **Longitudinal Studies**: Future research could employ a longitudinal design to capture the temporal changes in ESG scores and financial multiples, providing a more dynamic view of their relationship.

b. **Causal Models**: Advanced statistical methods like structural equation modeling could be used to explore the causal relationships between ESG scores and financial performance.

c. **Sector-Specific Studies**: Given the variations observed across sectors, in-depth studies focusing on individual sectors could provide more nuanced insights.

d. **Global Perspective**: Expanding the study to include companies from different countries could offer a more comprehensive view, taking into account cultural and regulatory differences.

e. **Inclusion of Qualitative Data**: Future studies could incorporate qualitative data through interviews, surveys, or case studies to provide a more holistic view of the factors influencing ESG scores and financial performance.

f. **Policy Impact Analysis**: Research could also focus on assessing the impact of policy changes on ESG scores and financial multiples, providing valuable insights for policymakers.

g. **Machine Learning Approaches**: Advanced machine learning techniques could be employed to identify complex, non-linear relationships between variables that traditional statistical methods may not capture.

6. CONCLUSION.

6.1 Summary of Main Points.

The primary objective of this thesis was to investigate the influence of ESG scores on the valuation of companies, with a specific focus on M&A and PE transactions. The study was motivated by the growing importance of sustainability in the business world and the need to understand its financial implications.

We began by conducting a comprehensive literature review to understand the evolution of the ESG framework and its impact on financial strategies. This review served as the foundation for our empirical research, where we selected six financial multiples—EV/EBITDA, EPS, EV/Sales, Price-to-Book Ratio, Debt-to-Equity Ratio, and P/E Ratio—as indicators of company valuation. These multiples were chosen due to their widespread use in financial analysis and their relevance in assessing a company's market value.

To evaluate the relationship between ESG scores and these financial multiples, we employed statistical methods like correlation analysis and regression analysis. Our findings indicated a significant, though not overwhelmingly strong, relationship between ESG scores and certain financial multiples like EV/Sales. This suggests that companies with better ESG practices are often valued more highly in the market, thereby affecting their attractiveness in M&A and PE deals.

Further, we conducted a cluster analysis to understand how companies with similar ESG and financial profiles are grouped together. The analysis revealed that companies within the same sector often share similar characteristics, thereby confirming the sectoral influence on ESG scores and financial multiples. Interestingly, the cluster analysis also showed that the Transport sector was distinct, mostly forming its own cluster, indicating unique ESG and financial characteristics compared to other sectors.

In summary, our research provides empirical evidence supporting the notion that ESG factors are integral to a company's valuation, especially in the context of M&A and PE transactions. While the influence is not uniform across all financial multiples or sectors,

the overall trend suggests that sustainability is becoming an increasingly important consideration in financial valuation.

6.2 Contribution to The Literature on ESG Factors and Investment Decision-Making.

The contributions of this thesis to the academic and professional literature are manifold. While there is a growing body of research on the impact of ESG factors on financial performance, this study is among the first to specifically examine the role of ESG scores in the valuation of companies in the context of M&A and PE transactions.

a. **Sectoral Insights**: One of the unique contributions of this study is the sectoral analysis through cluster analysis. The research provides nuanced insights into how ESG scores and financial multiples vary across different sectors, thereby filling a gap in the existing literature that often treats companies as a homogeneous group.

b. **Methodological Advancements**: The use of multiple statistical techniques, including correlation analysis, regression analysis, and cluster analysis, adds a layer of robustness to the findings. This multi-method approach can serve as a blueprint for future research in this area.

c. **Practical Implications**: Unlike many studies that focus solely on the theoretical aspects, this thesis also delves into the practical implications of ESG scores on company valuation. It provides actionable insights for investment practitioners, particularly those involved in M&A and PE transactions.

d. **Focus on Financial Multiples**: By selecting widely-used financial multiples as indicators of company valuation, this study bridges the gap between academic research and practical application. It offers a more grounded understanding of how ESG factors can influence real-world financial decisions.

e. **Comprehensive ESG Analysis**: The thesis does not limit itself to a singular ESG score but also considers sub-components like Environment, Social, and Governance factors individually. This comprehensive approach allows for a more detailed understanding of which aspects of ESG are most influential in company valuation.

f. **Timeliness and Relevance**: Given the increasing regulatory focus on sustainability and corporate governance, the findings of this thesis are timely and highly relevant. They contribute to the ongoing discourse on the financial materiality of ESG factors and offer empirical evidence that can inform policy decisions.

By addressing these various aspects, the thesis enriches the existing literature and provides a well-rounded view of the complex interplay between ESG factors and financial valuation, particularly in the specialized fields of M&A and PE.

6.3 Practical Implications and Recommendations.

The findings of this thesis have several practical implications that extend beyond the academic sphere, offering valuable insights for industry practitioners, policymakers, and investors. Below are some of the key takeaways and recommendations:

a. **Investment Strategy**: For investment professionals involved in M&A and PE, understanding the role of ESG scores in company valuation can be a game-changer. This thesis suggests that higher ESG scores could potentially lead to higher valuations, thereby influencing investment decisions.

b. **Due Diligence**: During the due diligence process, ESG scores should be considered alongside traditional financial metrics. This multi-faceted approach can provide a more comprehensive view of a company's value and long-term sustainability.

c. **Risk Management**: Companies with higher ESG scores may be viewed as less risky investments. Investment professionals should incorporate ESG metrics into their risk assessment models to better capture the full spectrum of potential risks and rewards.

d. **Sector-Specific Insights**: Given the sectoral variations observed in the cluster analysis, investment professionals should tailor their ESG evaluation strategies depending on the sector in which a target company operates.

e. **Automation and Artificial Intelligence**: The thesis demonstrates that unsupervised machine learning techniques like cluster analysis can effectively categorize companies based on their ESG scores and financial multiples. This

opens the door for the automation of certain aspects of the investment evaluation process.

f. **Regulatory Compliance**: Policymakers could use the findings of this study to inform future regulations around corporate sustainability reporting and disclosures. Companies aiming to be ahead of the curve in compliance could also voluntarily adopt higher ESG standards.

g. **Transparency and Reporting**: Companies should be encouraged to disclose their ESG scores and related metrics in a transparent manner. This not only builds trust with investors but also allows for a more accurate valuation of the company.

h. **Investor Awareness**: Asset managers and individual investors should be educated on the importance of ESG factors in investment decision-making. This could be facilitated through workshops, seminars, and educational modules.

i. **Future Research**: Given the limitations of the current study, future research could focus on a larger dataset, different sectors, or even cross-border comparisons to validate and extend the findings of this thesis.

By implementing these recommendations, various stakeholders can make more informed decisions that not only maximize financial returns but also contribute to sustainable and responsible business practices.

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8. APPENDIX.

Automotive Sector in 2022

	Ratios/Company	Vollkswagen	GM (General Motors Company)	Toyota	BMW (Bayerische Motoren Werke AG)	Honda	Ford Motor Company (F)	Mercedes-Benz Group AG
Financial Ratios	EV/EBITDA x	6,5x	7,4x	9,5x	7,4x	4,5x	2,29x	1,45x
	EPS (ordinary share) in dollar	$ 29,63	$6,13	$18,27	$28,77	$3,66	$-0,49	$13,60
	EV/Sales x	0,8x	0,9x	1,2x	1,1x	0,6x	0,23x	0,26x
	Price-to-Book (P/B) Ratio x	0,35x	0,72x	1,17x	0,57x	0,57x	1,08x	0,77x
	Debt-to-Equity Ratio (D/E)	1,04	0,59	0,58	0,59	0,38	4,56	2,01
	P/E x	3,92x	5,49x	10,8x	3,05x	8,48x	-23,7x	4,53x
Scores	**ESG Rating**	**86**	**80**	**82**	**91**	**81**	**76**	**93**
	Environment	91	68	88	88	90	87	93
	E. Emissions	88	93	93	92	89	94	100
	E. Resource Use	97	99	85	73	83	99	89
	E. Innovation	90	37	87	94	94	77	91
	Social	**92**	**90**	**82**	**94**	**79**	**87**	**90**
	S. Human Rights	91	91	64	91	64	91	91
	S. Product Responsability	89	97	89	89	93	89	70
	S. Workforce	97	83	93	98	88	74	99
	S. Community	89	92	92	98	79	92	98
	Governance	**68**	**79**	**72**	**91**	**71**	**43**	**96**
	G. Management	59	70	71	97	90	28	95
	G. Shareholders	81	98	91	75	24	55	98
	G. CSR Strategy	93	97	47	82	47	97	96

Table 10: Data from automotive companies in 2022

Source:
The Complete Toolbox for Investors (2021) *The Complete Toolbox For Investors*. Available at: https://finbox.com/ (Accessed: 10 August 2023).
The long term perspective on markets (2010-2023) *Macrotrends*. Available at: https://www.macrotrends.net/ (Accessed: 10 August 2023).
Stock market : Quotes & financial news (2023) *MarketScreener*. Available at: https://www.marketscreener.com/ (Accessed: 10 August 2023).

Transport in 2022

	Ratios/Company	Euronav NV (EURN)	Frontline Ltd. (FRO)	DHT Holdings, Inc. (DHT)	Hapag-Lloyd AG (HLAG)	Scorpio Tankers Inc. (STNG)	Teekay Tankers Ltd. (TNK)	Nordic American Tankers Limited (NAT)
Financial Ratios	EV/EBITDA x	11,6x	7,98x	9,64x	0,97x	4,14x	4,01x	0,65x
	EPS (ordinary share) in dollar	$1,01	$2,21	$0,37	$96,90	$10,30	$6,68	$29,70
	EV/Sales x	5,74x	5,58x	6,47x	0,54x	3,02x	2,46x	0,09x
	Price-to-Book (P/B) Ratio x	1,56x	1,15x	1,37x	1,12x	1,31x	0,98x	0,35x
	Debt-to-Equity Ratio (D/E)	0,65	1,5	0,34	0,87	1,73	2,79	0,69
	P/E x	16,6x	5,49x	24x	1,83x	5,2x	4,61x	3,92x
Scores	**ESG Rating**	**57**	**33**	**26**	**79**	**50**	**41**	**8**
	Environment	53	29	12	73	37	53	7
	E. Emissions	65	49	19	82	53	58	16
	E. Resource Use	57	15	9	87	32	67	0
	E. Innovation	0	0	0	50	0	0	0
	Social	**40**	**38**	**22**	**86**	**52**	**51**	**11**
	S. Human Rights	3	53	0	82	65	51	0
	S. Product Responsability	67	67	67	91	86	65	23
	S. Workforce	69	16	33	96	22	36	17
	S. Community	52	24	24	71	52	62	14
	Governance	**86**	**31**	**48**	**76**	**63**	**13**	**6**
	G. Management	96	13	67	71	70	8	3
	G. Shareholders	83	94	11	90	20	5	23
	G. CSR Strategy	43	24	7	81	90	48	0

Table 11: Data from transport companies in 2022

Source:
The Complete Toolbox for Investors (2021) *The Complete Toolbox For Investors*. Available at: https://finbox.com/ (Accessed: 10 August 2023).
The long term perspective on markets (2010-2023) *Macrotrends*. Available at: https://www.macrotrends.net/ (Accessed: 10 August 2023).
Stock market : Quotes & financial news (2023) *MarketScreener*. Available at: https://www.marketscreener.com/ (Accessed: 10 August 2023).

Chemicals in 2022

	Ratios/Company	Dow Inc. (DOW)	DuPont de Nemours, Inc. (DD)	BASF SE (BASFY)	LyondellBasell Industries N.V. (LYB)	PPG Industries, Inc. (PPG)	Akzo Nobel N.V. (AKZOY)	Air Products and Chemicals, Inc. (APD)
Financial Ratios	EV/EBITDA x	5,03x	11,4x	5,37x	5,55x	13,8x	13,1x	13,2x
	EPS (ordinary share)	$6,28	$2,02	$-0,70	$11,80	$4,32	$2,01	$10,10
	EV/Sales x	0,83x	2,86x	0,66x	0,72x	1,99x	1,4x	4,41x
	Price-to-Book (P/B) Ratio x	2,04x	1,19x	1,05x	2,14x	4,48x	2,52x	3,93x
	Debt-to-Equity Ratio (D/E)	0,59	0,29	1,09	1,98	2,46	3,4	0,93
	P/E x	8,02x	34x	-66,3x	7,03x	29,1x	31,1x	23,1x
Scores	**ESG Rating**	**90**	**72**	**92**	**80**	**80**	**76**	**86**
	Environment	89	74	96	76	82	64	91
	E. Emissions	88	71	90	84	72	66	94
	E. Resource Use	85	79	98	74	89	96	88
	E. Innovation	95	73	100	71	85	28	91
	Social	**88**	**65**	**94**	**80**	**75**	**81**	**83**
	S. Human Rights	93	83	94	93	81	85	69
	S. Product Responsability	62	35	90	80	62	68	100
	S. Workforce	100	53	95	82	61	71	86
	S. Community	89	72	99	50	90	96	90
	Governance	**95**	**81**	**82**	**89**	**84**	**90**	**81**
	G. Management	93	73	91	96	79	87	78
	G. Shareholders	100	97	61	69	95	100	98
	G. CSR Strategy	100	100	71	85	87	90	72

Table 12: Data from chemicals companies in 2022

Source:
The Complete Toolbox for Investors (2021) *The Complete Toolbox For Investors*. Available at: https://finbox.com/ (Accessed: 10 August 2023).
The long term perspective on markets (2010-2023) *Macrotrends*. Available at: https://www.macrotrends.net/ (Accessed: 10 August 2023).
Stock market : Quotes & financial news (2023) *MarketScreener*. Available at: https://www.marketscreener.com/ (Accessed: 10 August 2023).

Luxury in 2022

	Ratios/Company	LVMH Moët Hennessy Louis Vuitton SE (LVMUY)	Kering SA (PPRUY)	Estée Lauder Companies Inc. (EL)	Burberry Group plc (BRBY.L)	Richemont SA	Ralph Lauren Corporation (RL)	PVH Corp. (PVH)
Financial Ratios	EV/EBITDA x	13,5x	8,33x	21,9x	6,87x	13x	7,34x	6,35x
	EPS (ordinary share)	$28,00	$29,30	$6,55	$0,98	$4,25	$7,58	$3,03
	EV/Sales x	4,65x	2,97x	5,21x	2,03x	3,02x	1,13x	0,82x
	Price-to-Book (P/B) Ratio x	6,19x	4,15x	16,6x	4,2x	4,03x	3,25x	1,16x
	Debt-to-Equity Ratio (D/E)	0,64	1,39	2,51	1,44	1,17	1,94	1,26
	P/E x	24,3x	16,2x	38,9x	17,1x	31,9x	15,4x	29x
Scores	**ESG Rating**	**76**	**80**	**72**	**81**	**78**	**80**	**82**
	Environment	89	96	88	88	71	84	71
	E. Emissions	100	100	92	83	95	84	24
	E. Resource Use	90	98	90	96	96	88	95
	E. Innovation	81	87	80	87	29	81	81
	Social	**82**	**95**	**82**	**71**	**84**	**90**	**86**
	S. Human Rights	93	94	81	94	93	93	93
	S. Product Responsability	67	98	71	27	58	83	83
	S. Workforce	99	100	97	74	91	86	78
	S. Community	58	90	86	96	94	99	95
	Governance	**59**	**54**	**36**	**89**	**73**	**61**	**80**
	G. Management	62	51	30	87	86	69	86
	G. Shareholders	39	45	21	96	15	15	62
	G. CSR Strategy	70	85	87	93	97	92	82

Table 13: Data from luxury companies in 2022

Industrial in 2022

Source:
The Complete Toolbox for Investors (2021) *The Complete Toolbox For Investors*. Available at: https://finbox.com/ (Accessed: 10 August 2023).
The long term perspective on markets (2010-2023) *Macrotrends*. Available at: https://www.macrotrends.net/ (Accessed: 10 August 2023).
Stock market : Quotes & financial news (2023) *MarketScreener*. Available at: https://www.marketscreener.com/ (Accessed: 10 August 2023).

	Ratios/Company	Honeywell International Inc. (HON)	3M Company (MMM)	Caterpillar Inc. (CAT)	Siemens AG (SIEGY)	Raytheon Technologies Corporation	ABB Ltd. (ABB)	Lockheed Martin Corporation (LMT)
Financial Ratios	EV/EBITDA x	16,5x	9,07x	14,8x	11,2x	14,6x	14,3x	14,4x
	EPS (ordinary share)	$7,27	$0,20	$12,60	$4,59	$3,50	$1,30	$21,70
	EV/Sales x	4,33x	2,37x	2,51x	1,67x	2,6x	2,02x	2,13x
	Price-to-Book (P/B) Ratio x	8,57x	4,61x	7,81	1,68x	2,04x	4,43x	13,3x
	Debt-to-Equity Ratio (D/E)	2,42	2,3	2,33	1,85	1,21	1	3,53
	P/E x	29,5x	11,8x	19x	22x	28,8x	23,3x	22,5x
Scores	ESG Rating	**84**	**90**	**82**	**87**	**67**	**92**	**71**
	Environment	84	90	85	76	76	98	86
	E. Emissions	80	93	86	90	72	91	93
	E. Resource Use	87	93	93	99	88	100	96
	E. Innovation	84	84	82	52	72	100	72
	Social	**84**	**96**	**76**	**92**	**63**	**89**	**71**
	S. Human Rights	95	95	72	95	31	93	31
	S. Product Responsability	80	96	71	81	81	71	81
	S. Workforce	79	93	66	100	82	99	97
	S. Community	74	99	93	94	77	95	94
	Governance	**86**	**81**	**88**	**86**	**65**	**89**	**60**
	G. Management	91	81	99	89	68	99	50
	G. Shareholders	98	69	49	79	50	58	68
	G. CSR Strategy	40	97	87	82	72	81	95

Table 14: Data from Industrial companies in 2022

Source:
The Complete Toolbox for Investors (2021) *The Complete Toolbox For Investors*. Available at: https://finbox.com/ (Accessed: 10 August 2023).
The long term perspective on markets (2010-2023) *Macrotrends*. Available at: https://www.macrotrends.net/ (Accessed: 10 August 2023).
Stock market : Quotes & financial news (2023) *MarketScreener*. Available at: https://www.marketscreener.com/ (Accessed: 10 August 2023).

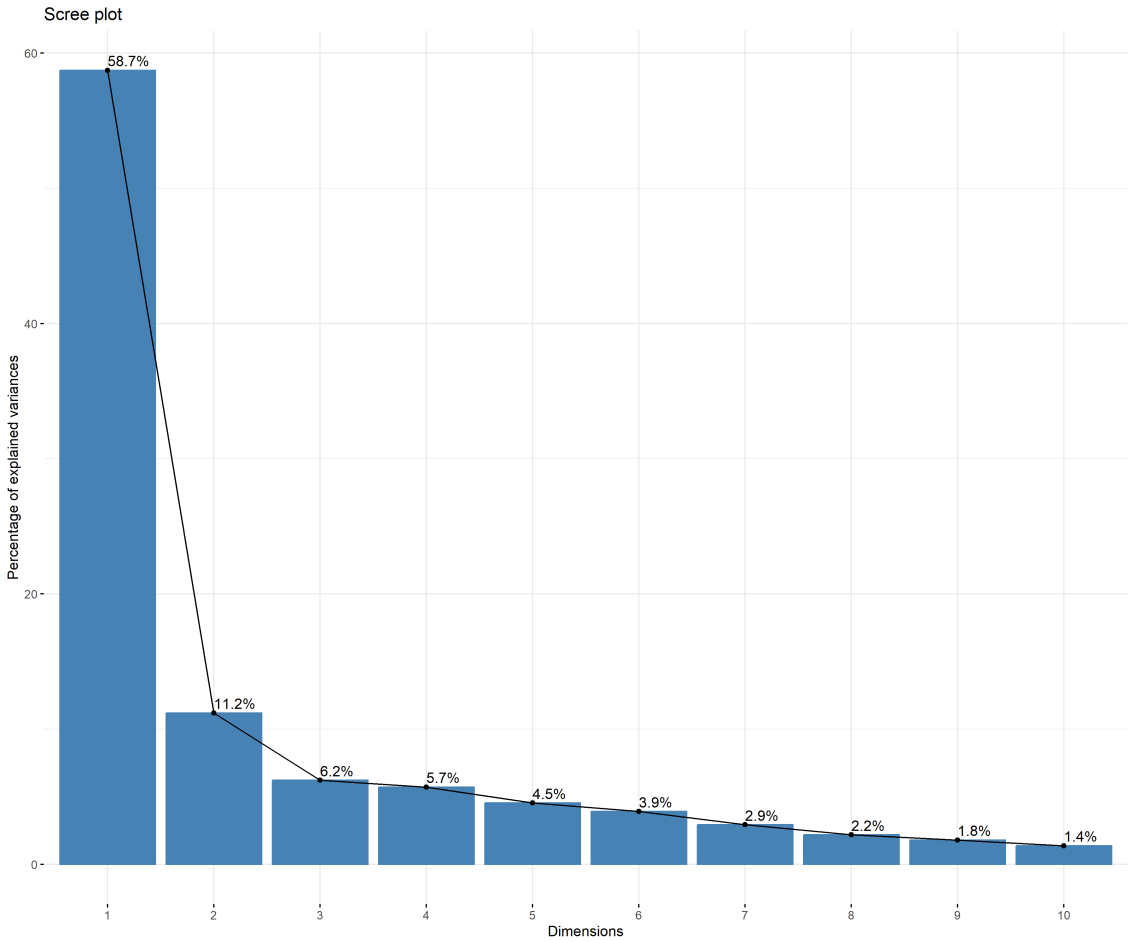

Figure 2: Dimensionality Reduction

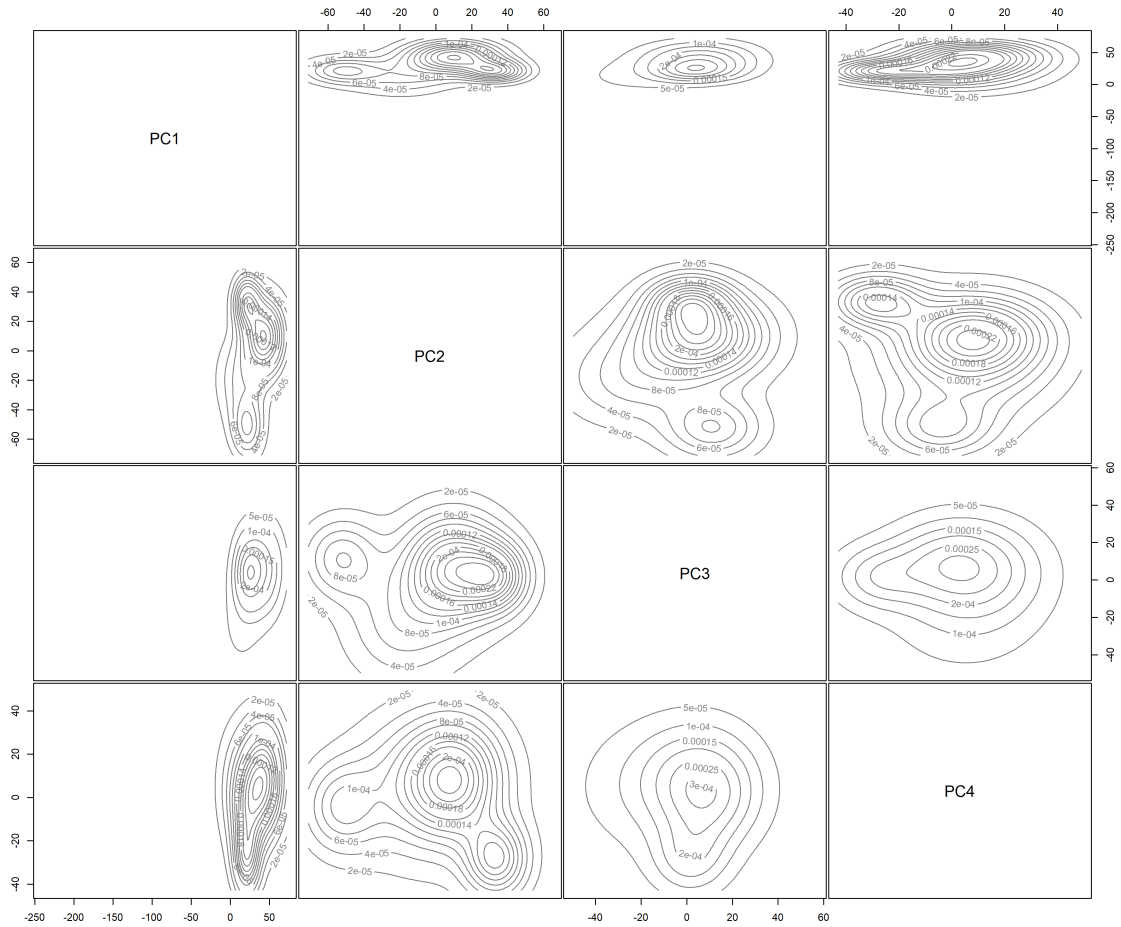

Figure 3: Cluster distribution as a function of the principal component resulting from dimensionality reduction.

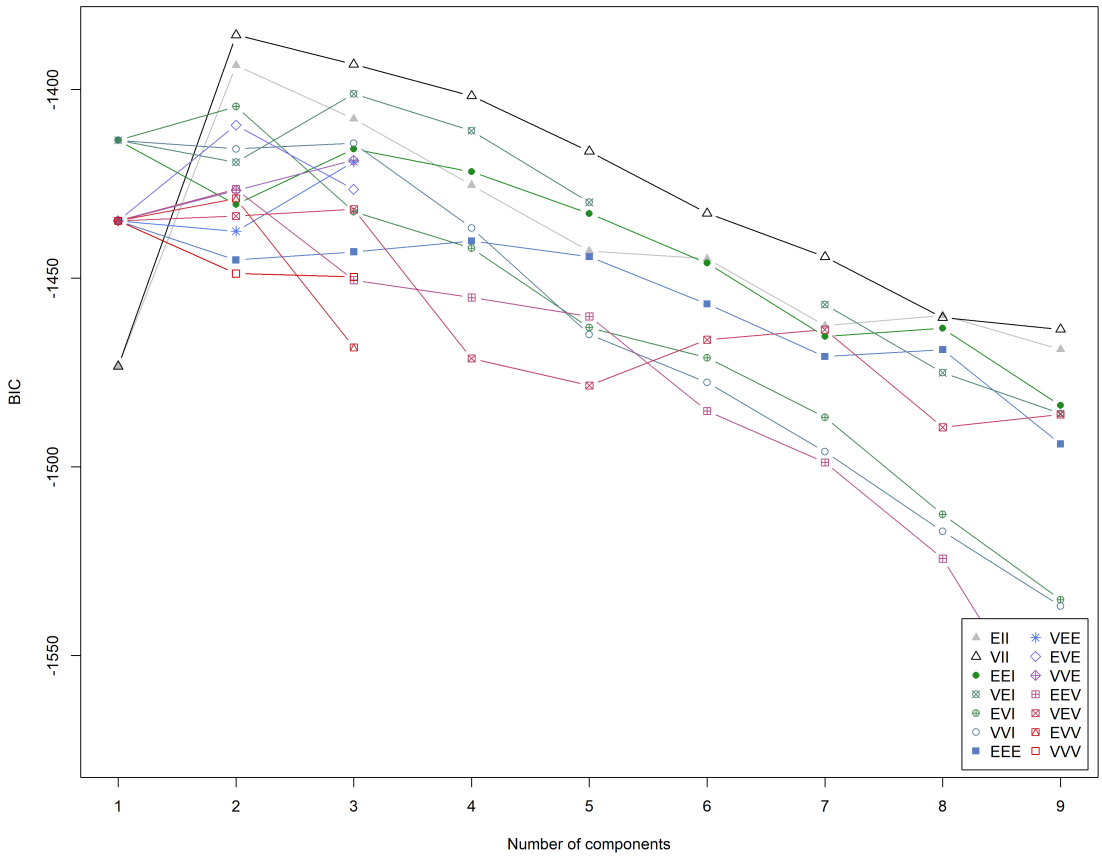

Figure 4: Optimal number and method of obtaining clustersTitle: Optimal number and method of obtaining clusters

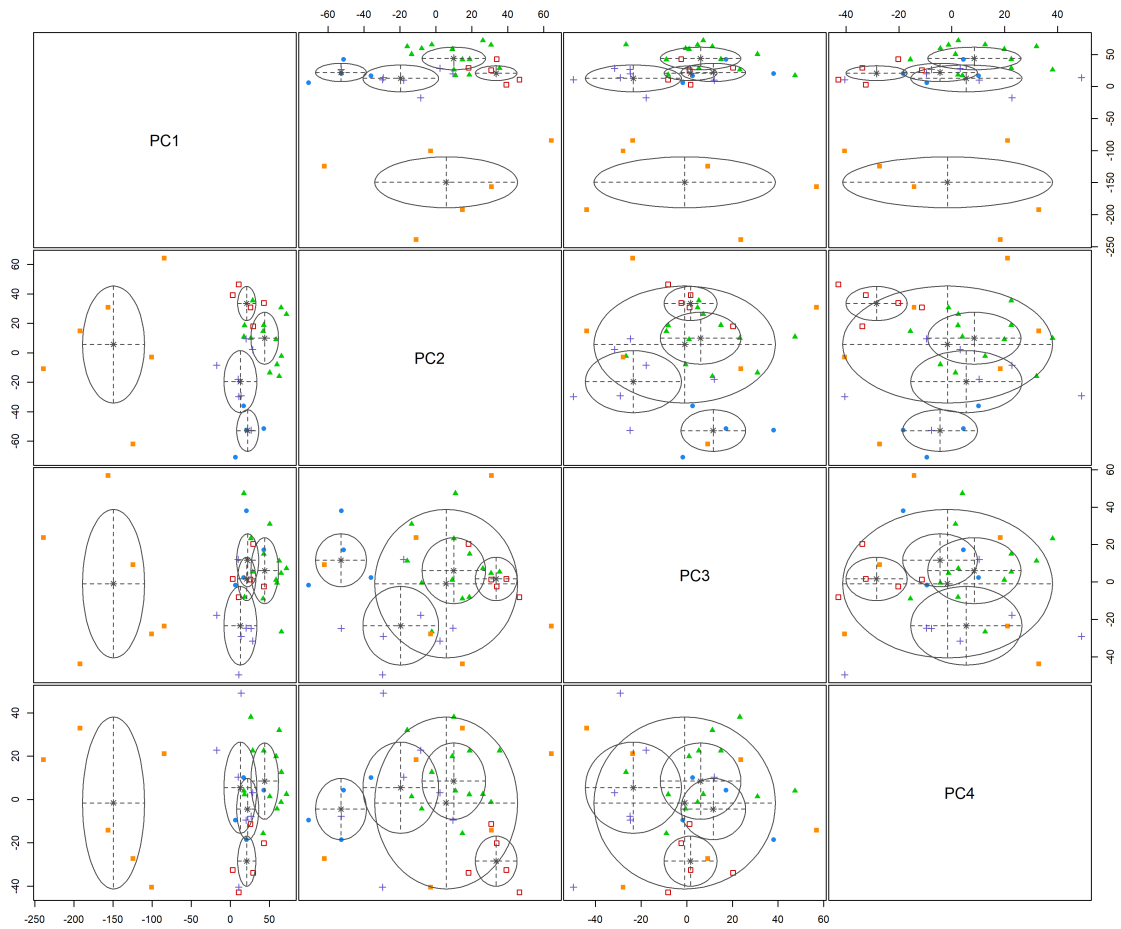

Figure 5: Cluster Number 1

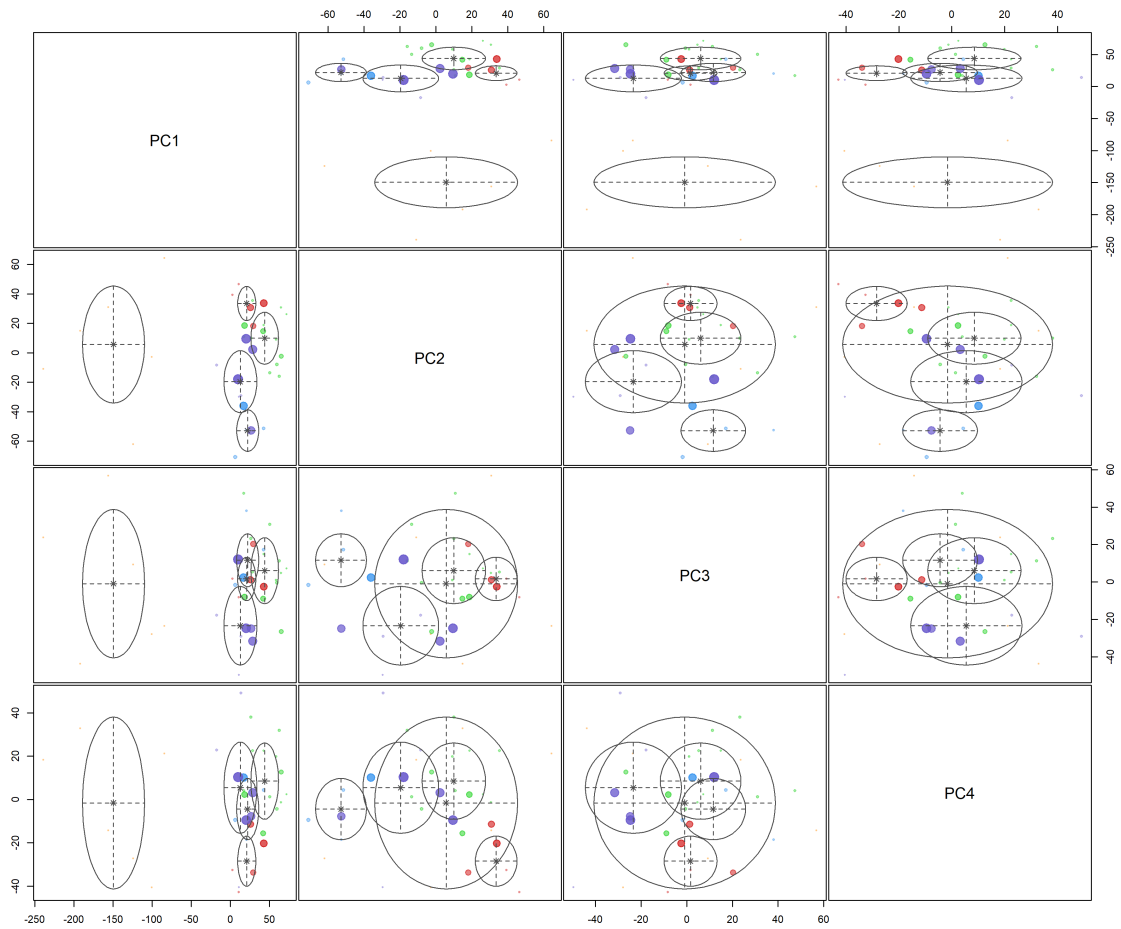

Figure 6: Cluster Number 2