Proceedings of the 3rd International Conference on Management Research and Economic Development
DOI: 10.54254/2754-1169/174/2025.21833

A Risk-Return Comparison Study of ESG Portfolios and Traditional Portfolios

Hao Wang[1,a,*]

[1]*Faculty of Liberal Arts and Professional Studies, York University, Toronto, M1W 2H2, Canada*
a. wh08031918@gmail.com
**corresponding author*

Abstract: Through a systematic literature review and empirical analysis, this study explores the differences and linkages between ESG portfolios and traditional portfolios in terms of risk-return dimensions from the perspectives of different market environments, industry characteristics and risk measures. First, the study reviews the Modern Portfolio Theory (MPT) and the Capital Asset Pricing Model (CAPM) and analyzes their limitations in extreme market environments and the neglect of non-financial factors. Second, the study examines the role of ESG factors in corporate value creation and risk management, showing that ESG practices can enhance corporate reputation, reduce financial risk, and increase portfolio stability. In addition, the study compares the construction logic, risk characteristics and financial performance of ESG portfolios with those of traditional portfolios, and finds that ESG investments generally exhibit greater risk resistance during periods of market turbulence, although inconsistencies in ESG rating standards remain a challenge for investors. The findings suggest that ESG investments should focus more on data transparency and standardization, and combine ESG factors with quantitative investment strategies. At the same time, adherence to a long-term investment strategy is critical to realizing the sustainable value of ESG investing.

Keywords: ESG, Efficient Frontier, Capital Asset Pricing Model, Sustainable Investing, Portfolio Diversification

1. Introduction

Against the backdrop of rapid global economic development and growing awareness of sustainable development, the concept of ESG investing, collectively known as Environmental, Social and Corporate Governance (ESG), has become an important consideration for investors in making investment decisions. ESG portfolios are not only seen as a more attractive option for socially sustainable development than traditional portfolios, but may also demonstrate advantages over traditional investments in terms of risk control and long-term returns. For example, a study by the Macro and Green Finance Lab at Peking University points out that one of the main advantages of ESG funds is that they typically invest in companies with high ESG scores, which excel in environmental, social, and corporate governance, helping the funds to hedge against the risks that they may suffer from ignoring ESG issues [1]. However, there are some shortcomings in the existing research that lead to disagreement: some scholars argue that ESG investments help reduce portfolio volatility and generate excess returns in the long run, while others point out that there is no

DOI: 10.54254/2754-1169/174/2025.21833

significant difference between ESG investments and traditional investments in terms of overall returns. For example, The Times reports that green funds in the UK have lagged the overall UK stock market by an average of 3.8% per year over the past five years, resulting in investor losses of nearly £22 billion [2].To address this disagreement, this study will be based on a systematic literature review and empirical analysis, starting with different market environments, industry characteristics, and risk metrics, to compare the differences and links between ESG portfolios and traditional portfolios in terms of risk-return dimensions. Therefore, this study will introduce and compare traditional and ESG investments to recognize the advantages and disadvantages of each investment method, so that investors can understand the more suitable investment method for themselves, and individual and institutional investors can make the right investment decision.

2. Literature Review

2.1. Traditional Portfolio Theory

Traditional portfolio theory is an important cornerstone of modern finance, and its core idea stems from the Modern Portfolio Theory (MPT) proposed by Harry Markowitz in 1952.Markowitz first proposed the mean-variance model in his seminal paper Portfolio Selection, which shifted the investor's investment decision from single asset selection to portfolio optimization. He proposed that while maximizing returns, investors should minimize the overall risk of the portfolio through diversification [3]. The theory introduced the concept of the efficient frontier, whereby investors can construct portfolios with the highest expected returns for a given level of risk. This framework laid the foundation for subsequent portfolio construction and risk management.

Subsequently, William F. Sharpe [4] proposed the Capital Asset Pricing Model (CAPM) based on the MPT, which provided a further risk-pricing framework for portfolio theory.The CAPM measures the systematic risk of individual assets relative to the overall volatility of the market through the introduction of beta coefficients and describes, through the securities market line (SML), the risk-expected return linear relationship. Sharpe proposed that the excess return of an asset should be proportional to the market risk it bears, thus providing investors with a tool to measure whether an asset is being reasonably priced [4]. In addition, Sharpe proposed the Sharpe Ratio, which has become a standardized measure of “return per unit of risk” in investment performance evaluation, providing an intuitive comparison of risk-adjusted returns on investment portfolios [5].

The core formula of the CAPM:

$$Ra = Rrf + [\beta a * (Rm - Rrf)] \quad (1)$$

Although the CAPM model is widely used in finance, its assumptions (e.g., market effectiveness, investor rationality, homogeneous expectations, etc.) have been repeatedly questioned in reality. Fama and French pointed out through empirical research that the one-factor CAPM model cannot fully explain the variability of asset returns, and they proposed a three-factor model that introduces two factors, in addition to the market factor, size (Small Minus Big, SMB) and value (High Minus Low, HML) factors, in addition to the market factor, which significantly enhanced the explanatory power of asset pricing [6].

However, the global financial crisis in 2008 exposed the limitations of traditional portfolio theory. Taleb, in his book “The Black Swan,” pointed out that traditional investment models fail in the case of extreme market events, and investors tend to underestimate tail risks [7]. In addition, the CAPM and its derivative models rely on historical data for risk prediction, but in extreme environments, historical correlations and volatility tend to be distorted, thus weakening the portfolio's resilience to risk.

DOI: 10.54254/2754-1169/174/2025.21833

In summary, traditional portfolio theory is an important guide in investment decision-making and risk management, but its sensitivity to extreme market events, neglect of non-financial factors, and high reliance on historical data have become its limitations.

2.2. The Relevance of ESG to Corporate Value Creation and Risk Management

Recently, with the rise of sustainable investment and environmental, social, and corporate governance (ESG) investment, people have begun to explore the inclusion of non-financial factors in the portfolio construction framework. Friede, Busch, and Bassen's analysis indicates that the vast majority of empirical studies have found that there is a positive correlation between ESG investment and financial performance, which challenges the assumption that "non-financial factors have no value" in traditional portfolio theory [8]. This challenges the traditional portfolio theory assumption that "non-financial factors are worthless.". In addition, Giese et al. empirically analyze the cash flow, idiosyncratic risk, and valuation channels and find that the inclusion of ESG factors in investment portfolios helps to enhance long-term returns and effectively reduces volatility and downside risk [9].

With the popularization of the ESG investment concept, researchers have begun to explore the specific impact of various ESG dimensions on corporate value creation and risk management from a more granular perspective. Eccles, Ioannou, and Serafeim did a long-term comparison study of high- and low-sustainability firms and found that high-sustainability firms do better in terms of managing the business, getting shareholders involved, and making money [10]. They point out that ESG practices can improve corporate reputation, strengthen brand value, and help attract long-term investors, which can result in a premium in the capital market. This study confirms that ESG is not only an ethical choice but also a business strategy to enhance the long-term competitiveness of enterprises.

In terms of corporate risk management, ESG is considered an effective tool for identifying and mitigating potential risks. Goss and Roberts found that firms with high ESG ratings are more likely to obtain favorable lending terms in the credit market as they are perceived to be borrowers with lower default risk [11]. In addition, Kruger finds that negative ESG events (e.g., environmental pollution scandals, labor issues, etc.) significantly reduce the market value of firms, reflecting investors' sensitivity to firms' reputations and potential legal liabilities, by examining firms' market reactions to controversial social responsibility events. This study suggests that good ESG performance can act as a "buffer" for corporate risk management, reducing a company's vulnerability to market turbulence or reputational crises [12].

At the same time, ESG factors are also widely used for portfolio risk control. Gunnar Friede, Timo Busch, and Alexander Bassen find that about 90% of studies show a non-negative correlation between ESG and financial performance, and some of them even show a positive premium, based on an aggregated analysis of more than 2,000 empirical studies. positive premium [8]. This research provides strong empirical support for the effectiveness of ESG investment strategies in the area of risk management. Further research shows that ESG portfolios typically perform more robustly during periods of high market volatility, such as the financial crisis, which is closely related to their greater risk tolerance. In terms of corporate governance, the governance dimension (G) of ESG has been viewed as an important means of enhancing corporate transparency and reducing agency costs [13]. Gompers, Ishii, and Metrick suggest that firms with good governance structures typically receive higher valuations in the market, while firms lacking transparency and accountability are more susceptible to risky events such as financial scandals [14]. This view is further validated in subsequent studies, with Bebchuk, Cohen, and Ferrell noting that optimization of corporate governance structure can effectively reduce the cost of capital and increase firms' resilience to external shocks [15].

DOI: 10.54254/2754-1169/174/2025.21833

Although a large number of studies have confirmed the positive impact of ESG on corporate value creation and risk management, the specific mechanism of ESG's role remains controversial in the academic community. On the one hand, Khan, Serafeim, and Yoon suggest that the materiality of ESG issues plays a key role in influencing firms' financial performance [16]. The study shows that positive financial returns may be realized only when firms focus on ESG issues that are closely related to their industries. On the other hand, some scholars have questioned the transparency and consistency of ESG rating criteria, arguing that there are significant differences in the ratings of the same firm by different rating agencies, which may lead to poor investor decision-making [17].

In summary, the existing literature generally recognizes that ESG practices have a positive impact on corporate value creation and risk management. Through environmental protection, social responsibility fulfillment, and improved corporate governance, companies can not only enhance brand reputation and attract long-term investors but also effectively reduce legal, regulatory, and reputational risks. However, ESG investment still faces many challenges, such as inconsistent rating criteria and substantive topic selection challenges, which provide a broad space for future research. In the future, researchers can look into how changing ESG factors affect the value of a company and how openness about ESG factors might change the way investors act. This will help people understand how ESG factors create value and manage risk in a more complete way.

2.3. ESG portfolios VS Traditional Portfolios

ESG portfolios differ significantly from traditional portfolios in terms of construction logic, risk characteristics, and return performance. Traditional portfolios focus on financial indicators and the quantitative balance between return and risk. ESG portfolios, on the other hand, include non-financial factors like corporate sustainability and long-term value. A meta-analysis by Friede, Busch, and Bassen reveals that more than 90% of empirical studies show a non-negative correlation between ESG investments and financial performance, with about one-third of them yielding positive results [8]. This finding challenges the traditional assumption that “socially responsible investment reduces returns” and provides a theoretical basis for ESG investment. For example, the Morgan Stanley Perpetual Investments Institute found that ESG investment funds outperformed traditional funds during the 2020 COVID-19 period, with average returns 4.3% higher and volatility 3.1% lower. This suggests that ESG portfolios are more resilient in times of market crisis [18].

In terms of resilience, Nofsinger and Varma found that socially responsible investment (SRI) funds have significantly lower downside risk than traditional funds during periods of market turbulence such as financial crises [13]. This suggests that ESG portfolios are more robust in extreme market environments due to their focus on factors such as environmental and social risks and corporate governance.

From the perspective of investment return, there is still some controversy in the academic community about the advantages and disadvantages of ESG portfolios versus traditional portfolios. A portion of the research points to the advantages of ESG portfolios in terms of long-term returns and risk control. For example, Khan, Serafeim, and Yoon analyze firms' performance on “material” ESG issues and find that firms that score higher on key ESG issues outperform their peers in the long run and have lower volatility [16]. However, other scholars are cautious: Halbritter and Dorfleitner, in their study of the European market, note that not all ESG investment strategies generate superior returns and that some funds have over-focused on ESG ratings to the detriment of other financial fundamentals, resulting in returns comparable to, or marginally inferior to, those of traditional portfolios [19].

In practice, ESG portfolios typically have lower volatility, largely due to their emphasis on long-term corporate strategies and sound operations [9]. At the same time, some studies have also shown that investors' emotional preferences for ESG investments (e.g., social responsibility,

DOI: 10.54254/2754-1169/174/2025.21833

awareness of environmental protection, etc.) have, to some extent, contributed to the growing demand for ESG portfolios [20].

Although ESG portfolios exhibit certain advantages in terms of risk management and long-term returns, their investment effectiveness is limited by the transparency of ESG data, consistency of rating agencies, and differences in industry characteristics. For example, Berg, Koelbel, and Rigobon point out that there can be significant divergence in the ratings of the same firm by different ESG rating agencies, which poses an information asymmetry risk to investors [17].

Although a large number of studies have confirmed the positive impact of ESG on corporate value creation and risk management, the specific mechanism of ESG's role remains controversial in the academic community. On the one hand, Khan, Serafeim, and Yoon suggest that the materiality of ESG issues plays a key role in influencing firms' financial performance [16].

3. Discussion

Based on the above analysis, future investment strategies should place more emphasis on the centrality of ESG factors in investment decisions in order to achieve the dual goals of financial returns and social responsibility. Therefore, in the field of ESG investment, the following potential directions and suggestions can be emphasized.

Firstly, data transparency and standardization will be key to the development of ESG investment. Establishing unified ESG rating standards and disclosure norms can improve investors' trust and comparability of ESG data. Government regulators and industry groups can also push for companies to consistently and legally share ESG information. This will make the market more open and give investors a better foundation for making decisions.

Secondly, the integration of quantitative investment and ESG will further optimize investment strategies. By combining big data analytics and artificial intelligence technologies, investors can incorporate ESG factors into quantitative investment models to develop intelligent investment strategies that adapt to market changes. This will not only help improve portfolio performance, but also enhance investment sustainability by effectively combining ESG factors with market returns.

Finally, adherence to a long-term investment strategy is critical to the success of ESG investments. Institutional investors should adopt a long-term investment strategy that focuses on continuous improvement in environmental protection, social responsibility and corporate governance. This long-term perspective will help realize sustainable value creation and drive companies to continuously improve their ESG performance, ultimately creating a virtuous cycle.

Based on the above analysis we predict that the influence of ESG investment in the global financial market will continue to expand, especially in the European and American markets and the emerging markets in Asia-Pacific, showing a trend of rapid growth. With the intensification of issues such as climate change and social equity, green finance and impact investing will become the mainstream of investment. The development of digitalization and financial technology will further promote the intelligence and precision of ESG investment strategies.

4. Conclusion

Through a systematic literature review and case study analysis of traditional portfolio theory and ESG investment strategies, this study delves into the differences between the two in terms of investment logic, risk management, and financial performance. Traditional portfolios focus on financial returns and achieve risk control through diversification, but they ignore non-financial factors such as environmental, social, and governance, which shows some limitations when facing extreme market events and long-term risks.

DOI: 10.54254/2754-1169/174/2025.21833

In contrast, ESG investment incorporates sustainability factors into investment decisions, which not only helps to enhance the long-term value of enterprises but also strengthens the risk-resistant ability of investment portfolios. Empirical studies have shown that ESG investments have greater stability during periods of market volatility and tend to realize comparable or even better financial returns than traditional investments over the long term. These advantages have made ESG investment a mainstream trend in financial markets.

Nevertheless, ESG investment still faces challenges such as inconsistent rating standards and insufficient data transparency. Future research should be devoted to improving the ESG performance assessment framework and enhancing the reliability and comparability of data so as to provide investors with more accurate decision support.

References

[1] *Beijing Macro & Green Finance Lab. (n.d.). ESG funds' primary advantage: Investing in high ESG-rated companies to mitigate risks. Retrieved from https://mgflab.nsd.pku.edu.cn/en/InsightsUpdates/MGFInsights/822158f211b34fb09af0e7537858744e.htm*

[2] *The Times. (2024). Ethical funds underperform market trackers. Retrieved from https://www.thetimes.co.uk/article/esg-ethical-funds-underperform-market-trackers-zc7hdtw3p*

[3] *Markowitz, H. (1952). Portfolio selection. The Journal of Finance, 7(1), 77–91. https://doi.org/10.2307/2975974*

[4] *Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. The Journal of Finance, 19(3), 425–442. https://doi.org/10.2307/2977928*

[5] *Sharpe, W. F. (1966). Mutual fund performance. The Journal of Business, 39(1), 119–138. https://doi.org/10.1086/294846*

[6] *Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. The Journal of Finance, 47(2), 427–465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x*

[7] *Taleb, N. N. (2007). The black swan: The impact of the highly improbable.*

[8] *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. https://doi.org/10.1080/20430795.2015.1118917*

[9] *Giese, G., Lee, L.-E., Melas, D., Nagy, Z., & Nishikawa, L. (2019). Foundations of ESG investing: How ESG affects equity valuation, risk, and performance. The Journal of Portfolio Management, 45(5), 69–83. https://doi.org/10.3905/jpm.2019.45.5.069*

[10] *Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. Management Science, 60(11), 2835–2857. https://doi.org/10.1287/mnsc.2014.1984*

[11] *Goss, A., & Roberts, G. S. (2011). The impact of corporate social responsibility on the cost of bank loans. Journal of Banking & Finance, 35(7), 1794–1810. https://doi.org/10.1016/j.jbankfin.2010.12.002*

[12] *Krüger, P. (2015). Corporate goodness and shareholder wealth. Journal of Financial Economics, 115(2), 304–329. https://doi.org/10.1016/j.jfineco.2014.09.008*

[13] *Nofsinger, J., & Varma, A. (2014). Socially responsible funds and market crises. Journal of Banking & Finance, 48, 180–193. https://doi.org/10.1016/j.jbankfin.2013.12.016*

[14] *Gompers, P. A., Ishii, J. L., & Metrick, A. (2003). Corporate governance and equity prices. The Quarterly Journal of Economics, 118(1), 107–156. https://doi.org/10.1162/00335530360535162*

[15] *Bebchuk, L. A., Cohen, A., & Ferrell, A. (2009). What matters in corporate governance? The Review of Financial Studies, 22(2), 783–827. https://doi.org/10.1093/rfs/hhn099 15*

[16] *Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate sustainability: First evidence on materiality. The Accounting Review, 91(6), 1697–1724. https://doi.org/10.2308/accr-51383*

[17] *Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. Review of Finance, 26(6), 1315–1344. https://doi.org/10.1093/rof/rfac033*

[18] *Morgan Stanley Institute for Sustainable Investing. (2020). Sustainable investing: Reshaping investment in the COVID-19 era. Morgan Stanley. Retrieved from https://www.morganstanley.com/ideas/sustainable-investing-sentiment-covid-19*

[19] *Halbritter, G., & Dorfleitner, G. (2015). The wages of social responsibility—Where are they? A critical review of ESG investing. Review of Financial Economics, 26, 25–35. https://doi.org/10.1016/j.rfe.2015.03.004*

[20] *Riedl, A., & Smeets, P. (2017). Why do investors hold socially responsible mutual funds? The Journal of Finance, 72(6), 2505–2550. https://doi.org/10.1111/jofi.12547*