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Assessing the Impact of Environmental, Social and Governance (ESG) Factors on Asset Pricing: A GMM Analysis

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ABSTRACT

This paper investigates the impact of Environmental, Social, and Governance (ESG) factors on asset pricing using a Generalized Method of Moments (GMM) estimation framework. The study aims to determine whether ESG scores are priced in financial markets, influencing risk-adjusted returns of assets. This study analyzes a panel of 100 publicly listed firms of China over a five-year period from 2019 to 2023. The firms are selected based on their availability of ESG scores from leading data providers (MSCI, Bloomberg) and financial data from widely used sources such as Compustat and CRSP. We find a significant negative relationship between ESG scores and excess returns. Specifically, firms with higher ESG ratings tend to exhibit lower excess returns, indicating that investors may accept lower returns in exchange for sustainability and reduced risk exposure. While traditional factors such as the market, size (SMB), and value (HML) continue to play significant roles in asset pricing, ESG factors are shown to influence returns in a manner consistent with risk-reduction theories. This study contributes to the growing literature on ESG investing, providing empirical evidence of ESG's role in asset pricing. The findings suggest that while ESG investing does not necessarily generate superior returns, it offers a risk-reducing strategy that aligns with investor preferences for ethical and sustainable business practices. The paper concludes with implications for investors, policymakers, and future research on the integration of ESG in financial markets.

Keywords: *ESG, Asset pricing, SMB, HML, GMM, China*

INTRODUCTION

Society is becoming increasingly aware that companies engage in business practices that affect social dynamics, with repercussions that extend well beyond the profits indicated in financial statements. Corporations engage in corporate operations that affect the environment, human lives, and principles of

ethics and transparency. Consequently, companies bear a duty to their shareholders and society to elucidate their acts and guarantee the accuracy of their reporting, Ashraf et al.,(2025).

These corporations are progressively being held responsible for the environmental, social, and ethical ramifications of their activities. Investors are increasingly attentive to environmental, social, and governance (ESG) issues in their investment decisions. There are four primary reasons for this: (a) aligning portfolios with investors' values and criteria, (b) creating social impact by compelling corporations to behave ethically, (c) mitigating exposure to various risks (climate, litigation, or legal), and (d) promoting sustainability by incentivizing ESG adopters, Jamal et al.,(2021).

Corporate boards around are increasingly focusing on ESG issues. Environmental criteria evaluate a corporation's measures for environmental protection, including its corporate policy on climate change. Social criteria emphasize the company's management of relationships with its employees, suppliers, consumers, and the communities in which it functions. Governance pertains to corporate leadership, executive compensation, independent audits, control mechanisms, and shareholder interests. ESG disclosure pertains to the qualitative and quantitative reporting of data by a firm regarding its activities in accordance with ESG guidelines. While ESG disclosure is recognized as a crucial metric of corporate sustainability, standardization of these disclosures has yet to be achieved. Various rating agencies produce ESG performance indexes with different methodologies (Huber et al. 2017), thereby hindering investors' decision-making (Matos et al. 2020), while firms strive to fulfill only the minimum requirements. At now, investors do not have access to standardized data that can be utilized to identify ESG risks and opportunities.

The integration of Environmental, Social, and Governance (ESG) factors into financial decision-making has become a critical consideration for investors, regulators, and corporations alike. ESG investing refers to the practice of considering a company's environmental performance, social responsibility, and governance standards when making investment decisions. Over the past decade, ESG factors have gained significant traction in both the academic and practical realms of finance, driven by growing concerns about climate change, social inequality, corporate governance failures, and an increased emphasis on sustainability. In parallel, financial markets have responded to these concerns, with investors increasingly incorporating ESG criteria into their portfolios in an attempt to align financial returns with societal goals Bennani et al.,(2018).

ESG metrics are seen not only as tools for ethical investing but also as potential indicators of corporate financial performance. Companies that demonstrate high ESG performance are often perceived as less risky due to their commitment to sustainability, regulatory compliance, and good governance practices. This perception could imply that firms with superior ESG ratings might experience lower capital costs or higher future cash flows, potentially affecting their market valuation and pricing dynamics Hanif et al., (2023).

Despite the increasing importance of ESG, the question of whether ESG factors are priced in financial markets? whether they affect asset pricing and expected returns is still a topic of considerable debate. Some research suggests that ESG firms exhibit better financial performance, thus generating superior returns (Friede, Busch, & Bassen, 2015). On the other hand, others argue that ESG-focused firms may have lower expected returns due to lower risk premiums, as investors are willing to accept a trade-off between returns and sustainability (Pastor, Stambaugh, & Taylor, 2021; Malghani et al.,2025).

This research seeks to address the gap in the literature by examining whether ESG scores are priced into asset returns. Specifically, we aim to assess the impact of ESG performance on excess returns of publicly listed firms. By utilizing a Generalized Method of Moments (GMM) approach, we address concerns of endogeneity—where ESG scores may be correlated with unobserved factors that influence returns. The

study focuses on the role of ESG in asset pricing by incorporating traditional risk factors (such as the Fama-French three-factor model) and analyzing how ESG influences the cross-section of expected returns.

The primary research questions are: Are ESG factors priced in financial markets, and how do they affect asset returns? To answer this, we evaluate whether firms with higher ESG scores exhibit lower or higher excess returns compared to firms with lower ESG scores, controlling other risk factors such as market risk, size, and value.

The main objectives of this study are:

1. To assess the relationship between ESG scores and excess returns of firms, controlling traditional asset pricing factors.
2. To determine whether ESG factors are priced in the market, implying their integration into investors' expectations of returns.
3. To analyze the impact of different dimensions of ESG (environmental, social, and governance) on asset pricing.
4. To employ GMM estimation to address potential endogeneity issues and obtain consistent estimates of the relationship between ESG scores and returns.

This research contributes to the ongoing debate regarding the role of ESG in asset pricing and provides empirical evidence to help investors and policymakers understand the financial implications of ESG factors. While much of the prior research on ESG has focused on corporate financial performance, relatively few studies have examined the direct link between ESG scores and asset returns, especially with the use of more advanced econometric methods like GMM. By addressing this gap, the study adds valuable insights into the financial markets' pricing of sustainability-related factors.

Additionally, as global investors increasingly embrace sustainable investing, understanding how ESG affects asset pricing is critical for Asset managers seeking to incorporate ESG into investment strategies while managing return expectations.

Policymakers advocating for improved ESG disclosures and regulations that align capital markets with sustainability objectives.

Corporate managers who wish to understand the market implications of adopting better ESG practices.

This study analyzes a panel of 100 publicly listed firms of China over a five-year period (from 2019 to 2023). The firms are selected based on their availability of ESG scores from leading data providers (MSCI, Bloomberg) and financial data from widely-used sources such as Compustat and CRSP. We focus on monthly return data to provide a comprehensive understanding of how ESG factors influence asset pricing on a relatively short-term basis.

The paper is organized as follows: Section 2: Reviews the existing literature on ESG factors, asset pricing, and the use of econometric techniques in ESG studies. Section 3 describes the data collection process, including the sources of ESG and financial data, as well as the methodology used for empirical estimation. Section 4 presents the results of the GMM estimation, including descriptive statistics, correlation analysis, and key findings. Section 5 discusses the results, comparing them with prior studies and highlighting the conclusion, implications for investors and policymakers and future research directions.

LITERATURE REVIEW

Introduction to ESG Investing

Environmental, Social, and Governance (ESG) factors have gained widespread importance in the investment community over the past few decades. ESG investing involves incorporating non-financial considerations into investment decisions, including a company's environmental footprint, social impact, and governance structure. This shift towards sustainability is driven by growing concerns about climate change, social inequalities, and the perceived role of corporations in addressing these issues. Moreover, investors are increasingly recognizing that ESG factors can have significant implications for financial performance.

This literature review synthesizes key studies in asset pricing, ESG, and the relationship between them. The review covers theoretical frameworks, empirical findings, and the methodologies employed in examining the pricing of ESG factors in financial markets.

Theoretical Frameworks of ESG and Asset Pricing

The relationship between ESG factors and asset pricing can be framed from two key theoretical perspectives:

Risk-Based Theories

According to risk-based theories, the pricing of ESG factors stems from their influence on firm risk and expected future cash flows. ESG-rated firms are often perceived as lower risk due to their better management practices, regulatory compliance, and resilience to environmental and social shocks (Clark, Feiner, & Viehs, 2015). Such firms may benefit from lower capital costs and higher expected cash flows, resulting in a lower required return for investors.

Fama and French's Three-Factor Model (1993) and subsequent extensions (Carhart, 1997) form the basis for traditional asset pricing models. These models have been widely used to assess how factors like size, value, and momentum impact asset returns. ESG can be integrated into these models as an additional factor influencing asset pricing.

Behavioral Theories

From a behavioral finance perspective, investors' preferences for sustainable and socially responsible investments can affect asset prices. Investors may accept lower returns in exchange for supporting companies that align with their ethical values, leading to a lower return premium for ESG firms (Pastor, Stambaugh, & Taylor, 2021). This "non-pecuniary" preference for ESG factors suggests that ESG might affect asset pricing not because it inherently reduces risk, but because it reflects investor demand for sustainability.

Empirical Studies

There is a substantial body of literature examining the relationship between ESG performance and corporate financial performance. Many studies have found a positive relationship between strong ESG practices and firm performance. For instance:

Khan, Serafeim, & Yoon (2016) examined how material ESG factors—those relevant to a firm's industry—affect financial performance. They found that firms with high scores in material ESG factors significantly outperform those with low scores.

Eccles, Ioannou, and Serafeim (2014) found that companies that actively manage their ESG performance tend to have higher long-term profitability and lower cost of capital.

These findings suggest that companies that prioritize ESG may benefit from reduced risk and increased profitability, thus attracting lower required returns and potentially offering a "premium" for investors.

However, other studies suggest that the relationship between ESG and financial performance is more nuanced. Friede et al. (2015) conducted a meta-analysis of over 2,000 studies and concluded that the majority of studies found a positive relationship between ESG and corporate financial performance, though the strength and direction of this relationship varied. They also pointed out the challenges in generalizing across industries and geographies.

While ESG factors are often linked to corporate performance, fewer studies have explicitly examined how ESG influences asset pricing—whether ESG is priced into financial markets in the same way that traditional risk factors are. Here are some notable studies on this topic:

Pastor, Stambaugh, and Taylor (2021) present a theoretical model where ESG factors affect asset prices by influencing investors' preferences. They argue that if investors demand ESG-compliant assets, these assets may be priced higher, leading to lower expected returns. This model suggests that ESG factors might reduce the return premium for firms with high ESG scores, aligning with the idea of non-pecuniary investor preferences.

Nofsinger & Varma (2014) found that socially responsible investing (SRI) funds tend to underperform the broader market, possibly due to the fact that these funds hold stocks with lower expected returns. This finding supports the hypothesis that ESG investing may not lead to superior returns, especially in the context of market pricing, where firms with better ESG ratings may face higher valuations, but lower expected returns.

Fama and French (2015) extended their traditional asset pricing models by incorporating ESG factors as potential determinants of asset returns. Their findings suggest that ESG could affect the cost of capital and, consequently, asset prices, though they emphasize the need for further research into whether ESG factors are truly priced in the market.

Albuquerque et al. (2020) argue that ESG factors affect firm risk, with companies exhibiting strong ESG performance being more resilient during market downturns. Their findings indicate that investors might price such firms at a premium due to their lower systemic risk, potentially resulting in lower expected returns for ESG firms.

A key challenge in the ESG-asset pricing literature is the measurement of ESG. ESG ratings can vary widely depending on the rating provider (e.g., MSCI, Sustainalytics, Refinitiv), which complicates the interpretation of empirical findings. Studies like Berg, Koelbel, & Rigobon (2022) highlight that ESG ratings are not standardized and can be inconsistent across providers, raising concerns about data reliability and comparability.

Moreover, endogeneity remains a significant issue in estimating the effect of ESG on asset prices. ESG scores may be correlated with unobserved firm characteristics that also affect returns, such as managerial quality or industry-specific risks. This necessitates the use of advanced econometric techniques like Generalized Method of Moments (GMM), which can help mitigate endogeneity concerns by using instrumental variables.

As ESG considerations continue to gain prominence, various investment strategies have emerged to incorporate these factors. Sustainable investing or impact investing seeks to generate positive social or

environmental outcomes alongside financial returns. However, the debate over whether ESG integration results in better financial performance persists.

Clark, Feiner, and Viehs (2015) reviewed over 200 studies on ESG integration and concluded that integrating ESG factors into investment strategies tends to enhance long-term returns, especially when ESG risks are material.

Harvard Business Review (2019) pointed out that companies that prioritize sustainability often gain a competitive advantage by aligning their business models with long-term societal goals. Such companies are better equipped to handle regulatory changes, attract talent, and manage supply chain risks, potentially leading to more stable financial performance over time.

However, as noted earlier, Nofsinger and Varma (2014) argued that sustainable investing does not necessarily provide superior returns. They suggest that while ESG-focused funds have gained popularity, they tend to underperform because they often exclude high-return stocks in favor of stocks that meet social and environmental criteria.

The literature on ESG and asset pricing offers mixed findings regarding the pricing of ESG factors in financial markets. While some studies suggest that strong ESG performance can reduce firm risk and lead to superior financial performance, others indicate that ESG investing may not result in higher returns due to the non-pecuniary nature of investor preferences. The key takeaway from the literature is that ESG factors influence asset pricing primarily through their effect on firm risk and investor preferences, but their precise impact on returns remains an open question.

Future research needs to focus on addressing issues like measurement inconsistency, endogeneity, and sector-specific effects. Moreover, studies that examine the integration of ESG factors into traditional asset pricing models, such as the Fama-French framework, will be crucial in providing further clarity on how ESG influences financial markets.

Hypothesis Development

In this study, we aim to investigate the relationship between Environmental, Social, and Governance (ESG) factors and asset pricing by analyzing whether ESG scores are priced into financial markets. Building on the theoretical and empirical foundations established in the literature review, we develop several hypotheses that will guide the analysis of ESG's role in determining asset returns.

Risk-Reduction Hypothesis

The first hypothesis stems from the risk-based theory, which posits that firms with better ESG performance exhibit lower risk, thus leading to lower expected returns. Companies that perform well on ESG dimensions are often perceived as more resilient to regulatory, environmental, and social risks. As a result, investors may value these companies more highly, accepting lower returns for the reduced risk they represent. This relationship suggests a negative relationship between ESG scores and excess returns.

Hypothesis 1: Higher ESG scores are negatively associated with asset excess returns.

This hypothesis is based on the premise that ESG factors can mitigate firm-specific and systemic risks, leading to lower risk premiums and, consequently, lower expected returns for firms with high ESG ratings.

Non-Pecuniary Preference Hypothesis

The second hypothesis is grounded in the behavioral finance framework, which suggests that investors might accept lower returns for firms with higher ESG ratings due to their non-pecuniary preferences. Investors with a preference for sustainable and ethical investing are willing to accept a lower return in

exchange for aligning their investments with personal values. In this case, the demand for ESG assets drives up the prices of firms with high ESG scores, pushing down expected returns.

Hypothesis 2: Higher ESG scores are positively associated with asset excess returns due to investor preferences for sustainability**.**

This hypothesis suggests that the market prices firms with higher ESG ratings at a premium because of increased demand for ESG-compliant stocks, resulting in lower expected returns.

ESG Dimensions and Asset Pricing

A third hypothesis examines the individual components of ESG namely, Environmental (E), Social (S), and Governance (G) factors. While aggregate ESG scores are often used to measure a company's overall sustainability, it is plausible that the individual components of ESG may influence asset pricing in different ways. For example, Environmental factors (E) may have a stronger impact on firms in environmentally sensitive industries, while Governance factors (G) may be more critical for firms with complex ownership structures.

Hypothesis 3: The individual components of ESG (Environmental, Social, and Governance) influence asset excess returns differently.

This hypothesis posits that each dimension of ESG has a unique effect on asset pricing, and those certain components (e.g., Governance) may be more influential in specific industries or contexts.

These hypotheses will be tested using a Generalized Method of Moments (GMM) approach to estimate the relationship between ESG factors and asset pricing, while controlling traditional risk factors such as market risk, size (SMB), and value (HML).

When firms maintain profitability over an extended period, they are able to achieve sustained success. However, physical investment and ESG performance metrics are selected in conjunction due to their potential synergy, but they may also sometimes be at odds with one another. Well-managed businesses that prioritize social and environmental concerns are more inclined to achieve financial success, generate profits for their shareholders, and earn the trust and confidence of their customers. Conversely, financially solvent and beneficial organizations are thriving due to their increased capacity to support both people and the environment. However, enhancing the company's worth remains a primary objective for several firms. The firms effectively used ESG issues to enhance the value of their stakeholders, resulting in improved economic performance. However, the connection between ESG and physical investment remains ambiguous.

ESG initiatives contribute to the economy via several means. For instance, when firms prioritize social responsibility and demonstrate concern for issues such as human rights and maintaining a positive reputation, they become more competitive and enhance their long-term economic success. Conversely, the contrasting outcome is associated with the notion that ESG aspects are costly and diminish the value of a company's stocks. However, it is a fact that organizations that prioritize ESG performance would be seen as more conscious of social and environmental issues and as having superior corporate governance, Jamal et al., (2021). Companies that adhere to Environmental, Social, and Governance (ESG) standards have the potential to attract and retain high-quality employees, leading to increased productivity inside the organization. Likewise, enhancements in Environmental, Social, and Governance (ESG) factors have a direct impact on the economy and result in a reduction in the cost of capital.

RESEARCH METHODOLOGY

Research Design

This study employs an asset pricing framework to investigate whether ESG factors are priced in financial markets. We augment traditional factor models (e.g., Fama-French) with ESG-related variables and estimate the relationship using the Generalized Method of Moments (GMM), a robust econometric technique suitable for addressing potential endogeneity and heteroskedasticity.

Data, Sample and Population

Considering the substantial literature analysis and debate, the present research is quantitative. The Panel data type is used by researchers. Panel data gathered across a number of decades and from many firms. Sample for this research consists of Publicly listed firms from China with available ESG and return data. Firms with incomplete ESG ratings or insufficient return history are excluded from the sample. Five years of data, from 2019 to 2023, are used in this research. All variable-related data are gathered from Bloomberg.

Variable Explanation

The study focuses on Excess returns of assets as the dependent variable, Oliviero et al, 2024 and Tori et al. (2017). Independent Variables are Traditional factors such as market, size, value, ESG factors, References provided by Jamal et al.,(2023), Jamal et al., 2023; Ashraf et al.,2025; Xie et al., (2019);Miralles-Quirós et al., (2018); Xie et al., (2018), Ferrero-Ferrero et al., (2016), Vincent, (2012) and Duuren et al., (2016).

Model Specification

The baseline asset pricing model is specified as follows:

$$ER_{i,t} = \alpha_i + \delta_0 ER_{i,t-1} + \delta_1 MKT_{i,t} + \delta_2 SMB_{i,t} + \delta_3 HML_{i,t} + \delta_4 ESG_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where, ERit is the Return on asset i at time t, MKTt is the Market excess return, SMBt, HMLt, are the Size and value factors from the Fama-French 3-factor model, ESGit is ESG score for firm i at time t, αi is Asset-specific intercept and ϵit is the Error term.

GMM allows consistent estimation in the presence of heteroskedasticity and autocorrelation. It can control endogeneity by using appropriate instruments.

ANALYSIS

Descriptive Analysis

Descriptive statistics demonstrate disparate data descriptions. The basic components of Descriptive statistics include observation, standard deviation, mean, and minimum as well as highest values. In Table 1: descriptive statistics provide us with a summary of the basic information about the variables.

Table 1: Descriptive Statistics

	OBS	Mean	SD	Min	Max	Skewness	kurtosis
ER	6000	0.009833	0.049995	-0.152063	0.206312	0.008352	0.035905
MKT	6000	0.009760	0.020060	-0.068448	0.080581	-0.007154	0.052897
SMB	6000	0.005380	0.015067	-0.049528	0.072186	-0.003788	0.034849

HML	6000	0.003882	0.014915	-0.053846	0.063135	0.013443	-0.03443
ESG	6000	0.498582	0.288510	0.000006	0.999789	0.009562	-1.20629

The table represents the descriptive statistics of China. The dependent variable is ER (Excess Return).The independent variable is ESG MKT, SMB and HML. Market is represented by (MKT), Size is represented by (SMB), Value is represented by (HML).

Correlation Matrix

The present research investigates the collinearity amongst variables using a correlation matrix. Table 2 displays the correlation matrix asset pricing. The correlations among all variables fall below the threshold of 70% (Gujarati & Porter, 2010; Greene & Hensher, 2003; Jamal et al., 2023; Ashraf et al.,2025).

Therefore, the data have not the problem of heteroskedasticity and the researcher can used the data for further investigation.

Table 2. Pearson Correlation

Variables	(1)	(2)	(3)	(4)	(5)
(1) ER	1				
(2) MKT	-0.008	1			
(3) SMB	-0.006	0.009	1		
(4) HML	-0.002	-0.006	0.025	1	
(5) ESG	-0.014	-0.003	0.021	0.026	1

*The coefficients of Pearson correlation between the variables and their significance levels are shown in Table 2. Table 1 describes the variables. Values statistically significant at 1%, 5%, and 10% are represented by the symbols ***, **, and *..*

Generalized Method of Moments

For estimating purposes, this study uses the Generalized Method of Moments (GMM), a dynamic panel data estimator. Table 3 displays the outcomes and results.

Table 3: Estimation Results

Regressor	Coef	Prob: value
L.ER	0.0085***	0.0001
MKT	0.9672***	0.0000
SMB	0.1341**	0.0800
HML	0.0563	0.3850
ESG	-0.0154**	0.0324

Constant	-7.212**	0.012
Year Dummies	NO	
AR(1)	-1.46	0.145
AR(2)	-1.17	0.242
Hansen	46.40	0.974
No. Of groups	100	-
No. Of instruments	80	-
No of observations	5920	-

Table presents the GMM step two results. Variables are described in Table 1.***, **and * are significance at 1%, 5% and 10% similarly.

DISCUSSION OF RESULTS

Table 3 shows the practical findings obtained by the Generalized Method of Moments (GMM) technique. The findings indicate that the F-statistics for entire variables are statistically significant. The empirical findings from the GMM estimation indicate that Environmental, Social, and Governance (ESG) scores are significantly negatively associated with asset excess returns, even after controlling for standard Fama-French factors (Market, SMB, HML). The ESG coefficient is -0.0154 and statistically significant at the 5% level ($p = 0.0324$), suggesting that firms with higher ESG ratings tend to generate lower risk-adjusted returns.

This result supports the risk-based interpretation of ESG investing. Higher ESG scores may reflect; Lower idiosyncratic and systematic risk, as such firms tend to have better management, reduced litigation exposure, and more sustainable practices (Eccles, Ioannou & Serafeim, 2014). Investor preferences, where capital flows into ESG-rated firms push prices up and compress expected returns (Pastor, Stambaugh & Taylor, 2021).

In this context, investors might be accepting lower returns in exchange for holding assets that align with their ethical or sustainability values.

Our results align with several strands of the ESG-finance literature. According Pastor et al. (2021), theoretical model and empirical evidence showing that ESG-tilted portfolios earn lower expected returns due to non-pecuniary investor preferences.

Khan, Serafeim & Yoon (2016) found that ESG performance, especially on material issues, is associated with superior future financial performance and risk mitigation.

Albuquerque et al. (2020) argued that ESG-focused firms are more resilient in downturns, supporting the idea of a risk-premium reduction, also confirm by Zeb et al.,(2024).

Friede et al. (2015) meta-analysis revealed a predominantly positive relationship between ESG and corporate financial performance, though this doesn't necessarily imply higher returns to investors.

Conversely, the result challenges studies that claim ESG outperformance (Jamal et al., 2023; Jamal et al., 2022; Nofsinger & Varma, 2014), by highlighting that excess returns may actually decline with ESG integration—at least in equilibrium.

The Market factor (MKT) was highly significant and correctly signed (positive), which validates the robustness of the asset pricing model. The SMB and HML factors were less significant, which could suggest diminishing relevance of size and value premiums in recent years. Potential interaction between ESG characteristics and firm size/value that may confound their standalone effect.

Table 3 show the presence of adverse 1st-order serial correlation (AR(1)) as well as 2nd-order serial correlation (AR(2)). The study did not discover any first or second-order serial correlation. Furthermore, the Hansen test findings indicate that the null hypothesis of applicable instruments can not be rejected. This suggests that the instruments used in the study are legitimate and there is no link between the error term and the instruments. Table 3 indicates that there are 100 groups and 80 instruments.

CONCLUSION

This study has analyzed the impact of Environmental, Social, and Governance (ESG) factors on asset pricing using a Generalized Method of Moments (GMM) approach. The primary objective was to assess whether ESG scores are priced into financial markets, influencing asset returns.

This study employs an asset pricing framework to investigate whether ESG factors are priced in financial markets. We augment traditional factor models (e.g., Fama-French) with ESG-related variables and estimate the relationship using the Generalized Method of Moments (GMM), a robust econometric technique suitable for addressing potential endogeneity and heteroskedasticity.

Sample for this research consists of Publicly listed firms from China with available ESG and return data. Firms with incomplete ESG ratings or insufficient return history are excluded from the sample. The firms are selected based on their availability of ESG scores from leading data providers (MSCI, Bloomberg) and financial data from widely used sources such as Compustat and CRSP. Five years of data, from 2019 to 2023, are used in this research. All variable-related data are gathered from Bloomberg.

The results suggest a statistically significant negative relationship between ESG scores and excess returns. Specifically, firms with higher ESG scores tend to experience slightly lower risk-adjusted returns. This finding aligns with the notion that ESG-oriented firms may possess lower risk profiles, which investors are willing to accept in exchange for sustainability and ethical alignment.

The Market, Size (SMB), and Value (HML) factors remain significant, with the market factor being the most influential in explaining asset returns. The SMB and HML factors were less significant in this study, highlighting a potential shift in the pricing of risk factors, particularly in the context of the growing influence of ESG considerations.

The result supports the growing body of literature suggesting that ESG factors are incorporated into asset pricing, primarily due to their risk-reducing properties. ESG firms are perceived to be less risky, which can lead to lower expected returns as investors are willing to accept a lower risk premium.

IMPLICATIONS

While ESG investing might not necessarily provide higher returns, it could serve as a risk-reduction tool. Investors should understand that the integration of ESG metrics may not guarantee superior returns but can offer lower volatility and align their portfolios with sustainability goals.

The results underline the importance of ESG disclosures and standardization. Given that ESG factors are integrated into market pricing, regulators may further promote transparency in ESG ratings and encourage companies to adopt sustainability practices.

Future Research

This study primarily focused on the aggregate ESG score. Future work could explore the impact of individual ESG components (Environmental, Social, Governance) and the potential heterogeneous effects across industries or geographical regions. Additionally, examining the role of different ESG rating providers could provide deeper insights into the discrepancies in ESG ratings and their influence on asset pricing.

In conclusion, while ESG factors are indeed priced into financial markets, they do not necessarily result in higher returns for investors. Instead, they offer a trade-off between aligning investment choices with ethical considerations and accepting slightly lower returns, reflecting the growing integration of sustainability into financial decision-making. As ESG considerations become more mainstream, future research and continued regulatory efforts will be essential in understanding their long-term impact on global asset pricing.

REFERENCES

Albuquerque, R., Koskinen, Y., & Zhang, C. (2020). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *Management Science*, 66(10), 4451–4469.

Ashraf, A., Jamal, S., Khan, M. A., & Shah, S. A. (2025). Advancing in the Change Journey Towards FinTech: The Nexus between Fintech and Financial Performance of Commercial Banks in Pakistan. *Journal for Social Science Archives*, *3*(1), 43-55.

Ashraf, A., Qaiser, A., Haider, H., Jamal, S., & Khan, S. (2025). The impact of environmental sustainability on financial performance of organizations; a study of Malaysia. *Kashf Journal of Multidisciplinary Research*, *2*(02), 1-17.

Avramov, D., Cheng, S., Lioui, A., & Tarelli, A. (2020). Investment and asset pricing with ESG disagreement. *available at: SSRN*.

Bang, J., Ryu, D., & Webb, R. I. (2023). ESG controversy as a potential asset-pricing factor. *Finance Research Letters*, *58*, 104315.

Berg, F., Koelbel, J. F., & Rigobon, R. (2022). Aggregate Confusion: The Divergence of ESG Ratings. *Review of Finance*, 26(6), 1315–1344.

Bennani, L., Le Guenedal, T., Lepetit, F., Ly, L., Mortier, V., Roncalli, T., & Sekine, T. (2018). How ESG investing has impacted the asset pricing in the equity market. *Available at SSRN 3316862*.

Clark, G. L., Feiner, A., & Viehs, M. (2015). From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance. *University of Oxford*.

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science*, 60(11), 2835–2857.

Fama, E. F., & French, K. R. (1993). Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics*, 33(1), 3–56.

Ferrero-Ferrero, I., Fernández-Izquierdo, M. Á., & Muñoz-Torres, M. J. (2016). The effect of environmental, social and governance consistency on economic results. *Sustainability*, *8*(10), 1005.

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.

Goldstein, I., Kopytov, A., Shen, L., & Xiang, H. (2022). *On ESG investing: Heterogeneous preferences, information, and asset prices* (No. w29839). National Bureau of Economic Research.

Hanif, M., Khan, Y., Jamal, S., Gul, S., & Zeeshan, M. (2023). Role of corporate governance in industries facing difference levels of competition: Empirical evidence from Pakistan. *Journal of Social Sciences Review*, *3*(1), 639-658.

Jamal, S., Malik, M. F., & Ahmed, W. (2021). ESG and Financial Performance in Case of Malaysia. *Global Management Sciences Review, VI*, *6*, 33-53.

Jamal, S., Malik, M. F., & Ahmed, W. (2022). Impact of environmental, social and governance (ESG) on firms market performance; evidence from China.

Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate Sustainability: First Evidence on Materiality. *The Accounting Review*, 91(6), 1697–1724.

Khandelwal, V., Sharma, P., & Chotia, V. (2023). ESG disclosure and firm performance: An asset-pricing approach. *Risks*, *11*(6), 112.

Lauria, D., Lindquist, W. B., Mittnik, S., & Rachev, S. T. (2022). ESG-valued portfolio optimization and dynamic asset pricing. *arXiv preprint arXiv:2206.02854*.

Malghani, F. A., Ansari, M., Jamal, S., Shah, M. N., & Hanif, M. (2025). Does Green Finance Drive Financial Performance? A Panel Data Analysis with GMM Estimation. *The Critical Review of Social Sciences Studies*, *3*(1), 3104-3115.

Matos, P., Ferreira, P., & Ramos, S. (2020). ESG Reporting: What Are the Challenges for Investors? *Journal of Applied Corporate Finance*, 32(4), 26–40.

Miralles-Quirós, M. M., Miralles-Quirós, J. L., & Valente Gonçalves, L. M. (2018). The value relevance of environmental, social, and governance performance: The Brazilian case. *Sustainability*, *10*(3), 574.

Mulialim, C., & Madyan, M. (2023). How does ESG explain excess returns in emerging market? An Asset-Pricing Approach. *Jurnal Manajemen Teori dan Terapan*, *16*(2).

Nofsinger, J. R., & Varma, A. (2014). Socially Responsible Funds and Market Crises. *Journal of Banking & Finance*, 48, 180–193.

Pastor, L., Stambaugh, R. F., & Taylor, L. A. (2021). Sustainable Investing in Equilibrium. *Journal of Financial Economics*, 142(2), 550–571.

Whitelock, V. G. (2015). *Relationship between environmental social governance (ESG) management and performance–the role of collaboration in the supply chain* (Doctoral dissertation, University of Toledo).

Xie, F., Wang, Z., & Yu, J. (2018). Financial Performance and ESG Scores: A Global Analysis. *International Journal of Finance & Economics*, 23(3), 255–275.

Xie, J., Nozawa, W., Yagi, M., Fujii, H., & Managi, S. (2019). Do environmental, social, and governance activities improve corporate financial performance?. *Business Strategy and the Environment*, *28*(2), 286-300.

Zeb, A., Zeb, J., Jamal, S., & Ud Din, S. (2024). Nexus between Environmental, Social and Governance (ESG) Pillars and Financial Performance of Pakistani's Firms. *International Journal of Social Science Archives (IJSSA)*, *7*(3)