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Is There A Risk Premium in ESG Investing in India?

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Abstract: Research Question: To check whether the ESG scores of Indian companies impact their share prices and risk-adjusted returns. **Motivation:** Increased awareness about sustainability has sensitised both institutional and individual investors regarding ESG activities of their portfolio firms. They identify these activities as sources of both opportunity and risk There are conflicting perspectives on ESG and stock returns and a pressing need to clarify the ESG disclosure implications on investment performance and risk, more so due to the growing monitoring by exchanges, regulators, and institutional investors. **Idea:** The study aims to check if the nonfinancial information in ESG scores can be a source of risk premium (or alpha) for investors, especially after accounting for factors such as size, value, and momentum. The study constructs a positive-screened, negative-screened, and hedged portfolio to capture the alpha based on ESG strategies. **Data:** The study employs Bloomberg's ESG composite score data between April 2010 and February 2020 on NSE 500 companies, including companies that, by regulation, were required to report ESG disclosures in the period of study. **Method/Tools:** Two mutually exclusive portfolios with differing ESG profiles were formed to construct the high- and low-ESG-rated portfolios. A third portfolio, the difference/hedged portfolio, is formed by subtracting the monthly returns of the low-ESG-rated portfolio from those of the high-ESG-rated portfolio (H-L). The study aims to contrast the returns of companies with high and low ESG scores, and of hedged portfolio. The raw and risk-adjusted returns of the hedged portfolio were then examined. **Findings:** The findings of the study highlight that in the Indian context, ESG-based investment strategies generate negative alpha and predict lower future returns. The findings of the study have several implications for investors and policymakers. Institutional investors with a mandate to invest in high-ESG firms may not be able to generate positive long-term risk-adjusted returns. It must also be useful for policymakers trying to push ESG-based strategies among asset managers like pension funds. **Contributions:** The current study add to the existing ESG literature in Indian stock market context and highlight that ESG based stock selection doesn't create value but may satisfy nonpecuniary motives of investors.

Keywords: ESG performance, emerging economy, stock performance, portfolio theory, sustainable investment, stock returns, Fama French Model.
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1. Introduction

Capital markets have grown increasingly complex, interconnected, and competitive over the years, necessitating the need for robust risk management mechanisms, especially in the wake of the 2008 economic crisis. Regulatory organizations must emphasize the necessity of greater corporate disclosures to protect investors from capital market shocks by assisting them in understanding the risks connected with environmental, social, and governance (ESG) factors. ESG disclosures are defined as "a voluntary reporting process by which information relating to corporate operations from environmental, social, and governance perspectives is made available to stakeholders" (Suttipun, 2021). The acronym ESG was coined in 2004 during the launch of the U.N. Global Compact Initiative by Kofi Annan, former U.N. Secretary-General, to help companies focus on sustainable operations and undertaking corporate responsibility. In the recent past, the idea of sustainability has also gained a lot of support among investors. "Sustainable investing is both value-driven and value-based" (Hale, 2018). For investors, it drives value as it is a technique for risk reduction and return maximization. Due to the growing realization that businesses don't operate in a vacuum and instead have an impact on many people's lives, it is now an essential consideration (value-based) during a firm's investment process and what drives their value.

Sustainable investing and ESG further received thrust in 2015 when the U.N. General Assembly passed a resolution in support of 17 Sustainable Development Goals, encompassing important "global social, economic, and environmental challenges" to be solved by 2030. Firms and investors have embraced the framework of the SDGs to drive their value. The governments are announcing numerous tax incentives to encourage firms to make ESG disclosures, which will contribute to the UN goal of achieving all firms' ESG disclosures by 2030. In India, CRISIL Ltd. recently, in June 2021, launched the ESG scores of 225 companies across 18 sectors to increase market efficiency (Crisil, 2021), thus boosting sustainable investing.

According to the Governance & Accountability Institute, 86% of S&P 500 companies produced sustainability or corporate responsibility reports in 2018, up from less than 20% in 2011 (G&A, 2018). The fact that in 2019, 300 mutual funds with ESG mandates collected a total of $20 billion in net flows, which was four times the level in 2018, demonstrates investor interest in ESG (Gillan *et al.*, 2021). Furthermore, over 3000 institutional investors and service providers have joined the Principles of Responsible Investment (PRI), a commitment to include ESG factors in their investment analysis and decision-making processes. These investors' assets under management have surged from $6.5 trillion in 2006 to nearly $111.2 trillion in 2020 (Gillan *et al.*, 2021). Bloomberg Intelligence also estimates that by 2025, more than $50 trillion (more than a third of total funds under management) will be invested in an ESG mandate (Powell, 2021).

The ESG activities of the firm will be useful for both institutional and individual investors while recognizing opportunities and risks facing the firm. Previous studies show that "investors reward good ESG firms, while poorly disclosed ESG is an indicator of idiosyncratic risks" (Mohammad and Wasiuzzaman, 2021). The ESG disclosure scores of the firms are an indicator of the ESG-related activities of the firm that would help remove information asymmetries and improve the investor's understanding of the firm's unique strengths and weaknesses. ESG disclosures thus serve as a non-financial key performance indicator for firms (Koh *et al.*, 2016). Yet, there are firms, especially in emerging economies, that have not adopted ESG disclosure in their external reporting. Investors with investment exposure in firms that have not adopted ESG disclosures can make poor investment decisions, thereby increasing their risk exposure to firms that indulge in negative environmental externalities, poor governance, HR policies, etc.

To explore the emerging market context, the study bases its inference on the impact of the ESG disclosure score on the firm's risk-adjusted returns in the context of India. Emerging economies, like India, prioritize economic growth and improving efficiencies and hence lag in adopting ESG activities when compared to their developed counterparts (Ali, 2017). There is a poor representation of emerging economies in ESG-related studies, and most of the research is done in the context of developed nations like the USA, Europe, and Australia (Muhammad Naeem, 2021).

India has been particularly considered as a sample for this study as it has captured the attention of developed economies looking for new investment opportunities. (Karl and Inderfurh, 2013). As per the National Intelligence Council, "India could be the rising economic powerhouse by 2030 that China is seen to be today" (ET, 2022). Despite bouts of volatility due to global cues, the Indian stock market continues to be a popular investment destination among its Asia-Pacific counterparts (Sanyal, 2023). The optimism in the Indian stock markets has been attributed to several factors, including political stability, foreign portfolio inflows leading to higher liquidity, increasing domestic involvement, and optimism about India's future growth potential. As per the Morningstar report, the value of foreign portfolio investment in Indian stocks reached USD 738 billion in the last quarter of 2023. India now boasts the fourth-largest stock market in the world, with USD 4.33 trillion of the combined value of listed shares (Bloomberg, 2024), just after the US, China, and Japan.

In India, ESG reporting started in 2009 with the issuance of voluntary guidelines on corporate social responsibility by the regulatory body, the Ministry of Corporate Affairs. With the opinion that these disclosures will help investors make informed decisions the capital market regulator, the Securities and Exchange Board of India (SEBI), introduced ESG reporting requirements in 2012, and the top 100 listed companies by market capitalization were mandated to file the same in the form of business responsibility reporting. In 2015, the mandate was extended to the top 500 listed companies by market capitalization. In 2021, SEBI introduced the Business Responsibility and Sustainability Report (BRSR), and in 2022–23, filing of the BRSR was made mandatory for the top 1000 listed companies by market capitalization and replaced BRR. Still, the biggest challenge for implementing ESG disclosures springs from small and medium-sized firms, which dilutes their interest in implementing ESG activities as well as making disclosures. Moreover, some market studies show that investors consider ESG as jargon for "greenwashing" and do not pay much attention to ESG scores during their investment decisions, thus further reducing the urgency for firms to invest in ESG disclosures (Yu, 2020; Bowen, 2014). Therefore, some past studies find no statistically significant relation between ESG score and firm performance (Humphrey, 2012;) due to the "incurred costs to implement socially responsible actions" (Chow *et al.*, 2014) and the "reduced opportunity set" (Friedman, 1970; Fabozzi, 2008). Some empirical studies show that the financial costs incurred by socially responsible activities outweigh the benefits reflected in firm performance (Arbel, 1983; Reeneboog, 1987; Brammer, 2006; Byun, 2008; Hong and Kacperczyk, 2009). Alternatively, some studies provide evidence that socially responsible behavior directly benefits all stakeholders, even if it is financially costly (Grewal *et al.*, 2017; Dareen and Victor, 2020). Thus, there are two conflicting perspectives on ESG, and there is a pressing need to clarify the ESG disclosure implications on investment performance and risk, more so due to the growing monitoring by exchanges, regulators, and institutional investors (Dareen and Victor, 2020).

With the growing importance of Indian equities in the investment world and increasing concern amongst institutional investors about "how companies are implementing recommendations of the Task Force on climate-related financial disclosures" (Tyagi and

Kalia, 2021), ESG integration in the investment strategy and its effect on the performance and risk of firms as well as investment portfolios is important in the Indian context. Even though the ESG landscape in India is evolving, there are only a handful of Indian ESG-related studies, and most of them do not explore the effect of ESG disclosures on stock performance.

To add to the current ESG literature, we define our research question as whether the ESG scores of Indian companies impact their share prices and risk-adjusted returns. The study aims to check if the nonfinancial information in ESG scores can be a source of risk premium (or alpha) for investors, especially after accounting for factors such as size, value, and momentum.

Employing Bloomberg's ESG composite score data between April 2010 and February 2020 on NSE 500 companies, which represent around 90 per cent of the Indian equity universe (Chadha, 2023) and comprise all those companies that, by regulation, were required to report ESG disclosures in the period of study, we construct a positive-screened, negative-screened, and hedged portfolio to capture the alpha based on ESG strategies. The NSE 500 Index represents the top tier of the Indian stock market, offering insights into the market's overall health while providing easy access to a wealth of financial data crucial for academic research. Furthermore, the Nifty 500's influence on the economy makes them prime subjects for understanding investment decisions, corporate governance, and the financial system as a whole.

The findings of the study highlight that in the Indian context, ESG-based investment strategies generate negative alpha and predict lower future returns. Although marginal, the negative alpha increases as investors tilt their portfolios towards high-ESG-score stocks. On a standalone basis, the portfolio of high ESG-score stocks (the green portfolio) underperforms the portfolio of low ESG-score stocks (the brown/sin portfolio). Hence, investment strategies based on the non-financial content of ESG scores do not create additional value. The findings of the study have several implications for investors and policymakers. Investment strategies based on the non-financial content of ESG scores do not create additional value in India. Hence, institutional investors with a mandate to invest in high-ESG firms may not be able to generate positive long-term risk-adjusted returns. It may also be useful for policymakers trying to push ESG-based strategies among asset managers like pension funds. However, despite negative return predictability, the study does not discredit the potential gains of ESG-based strategies in terms of sustainable value creation through responsible investing. The negative returns can be a result of nonpecuniary gains from holding green stocks. It advocates the benefit of positive screening based on ESG scores as insurance against ESG events like the financial crisis of 2007 (Becchetti *et al.*, 2015) and COVID-19 (Beloskar and Rao, 2023).

The remainder of the article is organized into different sections. Section 2 presents a detailed literature review with testable hypotheses; Section 3 describes the data and methodology; Section 4 provides the empirical framework; Section 5 presents the results, and Section 6 presents the discussion and conclusion.

2. Literature Review

ESG investing is gaining attention in global equity markets due to the growing demand for investments that encourage sustainability. As per (Matos, 2020) signatories to the Principles of Responsible Investment were around $80 trillion in world's assets under management in 2019 and sustainable assets under management were around $30 trillion in 2019 (Fish *et al.*, 2019). A study conducted by RBC Global Asset Management showed that more than 70% of investors consider ESG criteria for investment decisions (RBC Global Asset Management Company, 2019).

The increased interest in ESG has necessitated the need for a simple and consistent framework of metrics to measure the sustainable practices of a firm and has resulted in the emergence of agencies that are providing data on the ratings, rankings, and scores of the composite ESG as well as the constituents environment, social and governance (Adams and Abhayawansa, 2022). For that matter ESG ratings or scores help to provide information and reduce informational asymmetries around the ESG risk of a company. Investors use these ratings while making investment decisions (Oehler, 2013; Latino *et al.,* 2021). This has further led to increasing demand for more consistent and comparable ESG disclosures, sustainability reporting as well as a demonstration of alignment to the United Nations Sustainable Development Goals (Blasc *et al.,* 2018). The firms are in a frenzy to "harmonise" the ESG frameworks, the national regulations for reporting and the alignment to the SDGs (Adams and Abhayawansa, 2022).

Apart from investors' demand, risk (reputation) management, regulatory requirements and higher returns are the main drivers of ESG integration in investment decisions. Investors also look forward to materiality in ESG investing. They expect that by constructing positive ESG-screened portfolios they will generate high returns (alpha or ESG premium) and be protected from losses due to ESG events.

The existing literature provides mixed evidence of ESG premium. As per the previous research on the relationship between sustainable investing and stock returns, a significant percentage of investors' preference for companies with high disclosure scores, "green businesses", should result in higher stock prices in comparison to companies with lower scores, "sin businesses" (Powell, 2021). Consequently, the sin stock, which is defined as "a publicly traded company involved in or associated with an activity that is considered unethical or immoral," would be at a disadvantage (Will, 2022), especially like companies in the business of tobacco, alcohol, gambling, etc.

In general, existing literature shows high ESG-rated companies create value for shareholders (Renneboog *et al.*, 2008; Khan *et al.,* 2016; Sherwood and Pollard, 2018; Khan, 2019; Serafeim, 2020) and few studies also provide evidence of higher risk-adjusted returns (Bauer, 2005; Statman and Glushkov, 2009). Studies show that firms with sustainable business models are more competitive, utilize resources more efficiently, and are better equipped to navigate macroeconomic turbulence and create value for their shareholders (Clark *et al.*, 2021). Firms with high ESG scores are expected to have lower exposure to systematic risk factors thus, a lower cost of capital (Fulton *et al.*, 2012; Dunn *et al.*, 2018; Switzer, 2018) and better stock performance and valuation (Clark *et al.,* 2015). Evidence also shows that stocks of high ESG scores firms have low idiosyncratic risks, higher compliance standards and better risk management (Oikonomou *et al.*, 2012). They are less susceptible to fraud and corruption (Hong and Kacpercyk, 2009) and tend to provide "insurance-like protection of firm value against negative events" (Hoepner *et al.*, 2013) with lower downside volatility and worst-case losses.

On the other hand, few studies (Pástor *et al.*, 2021) stressed the fact that higher returns in the case of sustainable assets are due to increased demand and not because of high expected returns.

Another perspective on ESG research stems from the argument that there is a negative relationship between ESG and stock returns. It was observed by Fabrozzi that the portfolio consisting of "sin" stocks displayed a better annual return over the benchmark vis-à-vis the portfolio return after removing the "sin" stocks (Barnett, 2007; Fabozzi, 2008). Thus, investors who are willing to bear reputational risk by investing in the "Sin" stocks to earn a higher risk premium may end up earning abnormal returns (Fabozzi, 2008; McDonald, 2014). There may be an economic gain for investors that comes from not abiding by sustainable investing because sustainable activities of the firms come at a cost, while some

investors may be biased against firms with low sustainability scores out of derision stemming from the firm's negative attitude towards societal goals.

(Blitz and Fabozzi, 2017) reported that the outperformance of the "sin portfolio" can be explained by the asset pricing model (Fama, 2015). It is also important to acknowledge empirical academic studies that highlighted the stock performance of companies that faced adverse media coverage on their ESG scores but did not experience negative investors' reactions thereby suggesting that low ESG scores may already be factored into their stock prices (Blitz and Fabozzi, 2017) also implying that "no premiums are attached to sin stocks" using modern asset pricing models as the news is already factored in the stock price (Fama, 2015).

(Engle *et al.*, 2019) constructed climate change hedge portfolios, similar to factor-mimicking portfolios and found negative alpha. They attributed the lower returns to insurance premiums paid for the climate hedge portfolio. (Renneboog *et al.*, 2008) regarded lower returns as the price paid by investors for integrating sustainable firms.

Many studies provide evidence that positive ESG-screened portfolios underperform the low ESG scored portfolio (Hong and Kacperczyk, 2009; Cheng *et al.*, 2013) or other benchmarks (Chan *et al.*, 2022). There is also evidence of high ESG-scored investments generating lower alphas (Bauer *et al.*, 2006, 2007; Balvers, 2017; Albuquerque *et al.*, 2019). Few studies showed that venture capital funds investing for social causes earn negative returns than traditional funds (Barber *et al.*, 2021). Also, the firms reporting engagement in environmentally friendly activities or winning green awards may experience "negative abnormal returns suggesting that investors punish the firm for what they perceive as costly investments" (Byun, 2008; Kim, 2015). Conversely (Lovas, 2015) contended that the underperformance of high ESG integrated portfolios is a result of lower diversification capability due to a decreased opportunity set.

Several past studies present an equally interesting perspective that there is no relationship between ESG scores and stock returns. This perspective emanates from the same logic presented by (Blitz and Fabozzi, 2017) that markets are efficient implying ESG information is already factored into the stock price (Humphrey, 2012; Statman, 2006). Thus, investors should not expect abnormal returns stemming from the sustainable portfolio strategy (Arbel, 1983; Reeneboog, 1987; Hong and Kacperczyk, 2009). Portfolio performances can vary not necessarily due to ESG compliances but on account of other factors that may be fund-specific in nature, industry element, human element, market-specific, and firm-specific (Humphrey, 2012; Revelli, 2015; Daugaard, 2019; Plagge, 2020). Li and Polychronopoulos (2020) constructed a long-short factor portfolio based on ESG ratings and found an absence of alpha. They repeated the same on European companies and concluded the same observation. Several other studies found no difference in ESG-driven investment and traditional portfolio returns (Bauer *et al.*, 2007, 2006; Renneboog *et al.*, 2011). There are also studies which have attributed ESG integration in investments as discrete and driven by non-pecuniary incentives (Derwall *et al.*, 2011). (Beck *et al.*, 2016) defined the three main criteria for ESG to be a risk factor, evidence from existing literature, and ESG performance attribution to be robust across definitions and geographies.

Based on the existing literature, integration of ESG in investments and lack of studies based on quantitative and systematic manner related to risk-adjusted returns after controlling for well-known risk factors, the current study intends to capture the relationship between ESG disclosures and a firm's raw and risk-adjusted returns to clarify the ambiguity related to the ESG-Stock returns relationship in the Indian context. Therefore, the present study hypothesis:

Hypothesis 0: ESG-based Indian stock portfolio does not create a risk premium.
Hypothesis 1: ESG-based Indian stock portfolio creates risk premium.

3. Methodology

The primary source of ESG data is Bloomberg. The study employs ten-year (2010–2020) ESG data available on Bloomberg for the top 500 companies by market capitalization listed on the National Stock Exchange of India, which represents around 90 per cent of the total market capitalization of the entire Indian stock market. Bloomberg provides a yearly composite environmental, social, and corporate governance ESG score and individual scores for environmental (E), social (S), and corporate governance (G).

Portfolios based on composite ESG scores are formed annually by ranking all firms listed in the NSE 500 based on their ESG scores from the highest to the lowest (Dareen and Victor, 2020). Two mutually exclusive portfolios with differing ESG profiles are then formed by taking the midpoint of the firms' ESG ratings to construct the high- and low-ESG-rated portfolios. A third portfolio, the difference portfolio, is formed by subtracting the monthly returns of the low-ESG-rated portfolio from those of the high-ESG-rated portfolio (H-L). The study aims to contrast the returns of companies with high and low ESG scores. For this purpose, a technique similar to pair trading is employed. A hedge portfolio is created in which the returns of low-score ESG companies (score 2) are subtracted from those of high-score ESG companies (score 1). The raw and risk-adjusted returns of the hedged portfolio are then examined. The approach is very close to creating a simple ESG index fund that does not require any active portfolio management techniques. The idea is to calculate statistically significant differences in performance and risk between the high- and low-ESG-rated portfolios.

To examine whether there is any statistically significant difference in the risk and return of high- and low-ESG-score portfolios, three most common market models are used: The Capital Asset Pricing Model (CAPM), the Fama French Three Factor Model Fama (1992) and Carhart (1997). The purpose of using the three different models is to provide evidence of the significant and functional effect of each model on the study's objectives. For evaluating if there is a significant difference in the raw returns of equal-weighted high and low ESG portfolios, a paired T-test is applied.

3.1 Low ESG Confidence Portfolio (Top 50%/Bottom 50%)

Two mutually exclusive portfolios are formed by dividing half the portfolio of firms ranked in descending order of their ESG scores. The investors thus have only moderate exposure to ESG firms (Darren, 2020). The firms are initially ranked based on their ESG scores, and the top 50% of firms (based on their ESG rankings) get a score 1, and the bottom 50% of firms get a score of 2. The monthly average returns of both the portfolios (high and low) are taken. The hedged portfolio is created by taking the difference between the average monthly returns of high- and low-ESG portfolios. This process is repeated annually from 31.3.2010 to 31.3.2021.

3.2 High ESG Confidence Portfolio (Top 25%/Bottom 25%)

According to Darren (2020), investors with significant conviction towards a firm's ESG disclosures while making sustainable investment decisions prefer the top 25% of all the ESG-rated firms. Thus, to construct two portfolios where the firms are initially ranked based on their ESG scores, the top 25% of firms (based on their ESG rankings) get a score of 1 and the bottom 25% of firms get a score of 2. The monthly average returns of both the portfolios (high and low) are taken. The hedged portfolio is created by taking the difference

between the average monthly returns of high- and low-ESG portfolios. This process is repeated annually from 31.3.2010 to 31.3.2021.

The paper also aims to check if an ESG-driven investment strategy decreases the available set of securities for investment for investors, which may lead to low diversification. The residual risk (e2i) in market models is used to check the diversification effect. A value close to zero for residual risk signifies efficient diversification.

4. Empirical Framework

4.1 Regression Analysis of Market Models

ESG-screening results in the modification of risk exposures to conventional factors; therefore, the effect of factor alphas helps in evaluating the return attribution and risk exposure of ESG-screened portfolios more precisely. Along with raw portfolio returns, the study assesses risk-adjusted returns using the CAPM, which accounts only for the market risk premium or market factor, the Fama-French 3-factor model consisting of the market factor, the size factor (Small Minus Big factor, which mimics the risk factor in returns relative to size), HML (High Minus Low factor, which mimics the risk factor in returns relative to value), and the Carhart 4-factor model comprising of the market factor, the size factor (Small Minus Big factor, which mimics the risk factor in returns relative to size), and HML (High Minus Low factor, which mimics the risk factor in returns relative to value).

Basically, these models provide additional risk-return information to the market risk premium based on size, value, and momentum.

The risk adjustment of the hedged (high-low) portfolio returns based on the CAPM model is:

$$RHS_t - RLS_t = \alpha\rho + \beta(RM_t - Rf_t) + \in \rho_t \quad (1)$$

where, $RHS_t - RLS_t$ is the difference in the return of the high and low score portfolios; $RM_t - Rf_t$ is the market risk premium.

The risk adjustment of the hedge (high-low) portfolio returns based on the Fama French Three Factor Model (Fama, 1992) is:

$$RHS_t - RLS_t = \alpha\rho + \beta_1(RM_t - Rf_t) + \beta_2 SMB_t + \beta_3 HML_t + \in \rho_t \quad (2)$$

where, $RHS_t - RLS_t$ is the difference in the return of the high and low score portfolios; Rmt-Rft is the market risk premium; The SMB_t (Small Minus Big) factor mimics the risk factor in returns relative to size; The HML_t (High Minus Low) factor mimics the risk factor in returns relative to value.

The risk adjustment of the hedge (high-low) portfolio returns based on the Carhart Model (Carhart, 1997) is:

$$RHS_t - RLS_t = \alpha\rho + \beta_1(RM_t - Rf_t) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 WML_t + \in \rho_t \quad (3)$$

where, $RHS_t - RLS_t$ is the difference in the return of the high and low score portfolios; Rmt-Rft is the market risk premium; The SMB_t (Small Minus Big) factor mimics the risk factor in returns relative to size; The HML_t (High Minus Low) factor mimics the risk factor in returns relative to value; The WML_t (winners plus losers) factor mimics the risk factor in returns relative to momentum.

4.2 Paired Sample T-test

To find out the difference in raw returns of equal-weighted high and low ESG portfolios, a paired t-test is used. This will help to infer if the average portfolio returns of high- and low-ESG-score firms differ significantly and if they do, which portfolio gives a higher return.

5. Results

Table 1 provides the average annual total ESG scores. There is an increase in the average annual scores in ESG 2010–2020. This is in line with Galbreath (2013), who provided the same evidence for Australian firms over the period of 2002–2009 but contradicts Lee *et al.* (2021), who reported a decrease in the average annual ESG rating of Australian firms over 2006–2016.

Table 1: Descriptive statistics of annual total-ESG scores

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Full Period
Mean Score	17.47	18.56	18.81	20.00	21.00	21.54	22.99	26.68	28.15	29.04	28.62	23.18
Median Score	14.46	14.47	14.88	16.53	17.77	17.36	19.42	23.55	24.38	25.00	25.44	20.66
Std. Deviation	10.01	11.51	11.95	12.71	13.31	13.08	13.34	11.60	11.65	11.78	11.01	13.29
Minimum	7.89	7.02	7.02	7.02	7.02	8.33	8.33	9.09	9.65	9.09	9.65	7.02
Maximum	52.89	47.93	57.85	60.38	59.34	64.46	64.73	64.46	67.22	66.12	66.12	67.22
Count	223	234	252	279	285	280	273	273	275	274	252	2906

Notes: The table provides the descriptive statistics: the mean, median, standard deviation, minimum, maximum of annual ESG scores of the sample firms for the period between 2010 to 2020.

Table 2 shows the average monthly returns for high- and low-score portfolios made based on low (50%–50% split) and high (top 25%–bottom 25% split) ESG confidence. The table also provides the average monthly returns of the hedged (high-low score) portfolio for both low- and high-confidence portfolios, along with the paired t-test values. For both kinds of low (50%–50% split) and high ESG (top 25%–bottom 25% split) confidence portfolios, high ESG score portfolios generated lower average returns. The results are consistent with existing recent studies (Bauer, 2005; Adler, 2008; Hong and Kacperczyk, 2009; Bolton, 2021; Luo, 2022). High-score ESG portfolio underperformance may be attributed to a couple of reasons: one rationale is that they represent a smaller portion of the market and, as a result, have less opportunity to diversify; the second is that sustainability considerations put long-term sustainability ahead of short-term gain (Naffa, 2022). Third, the information related to the ESG score is easily available in the public domain and already priced in the firm valuation (Fama, 1970; Managi, 2012), and fourth is the presence of the 'equity greenium' (Pástor *et al.*, 2021). As investors become more aware of climate change and governance concerns, companies with strong ESG practices will command a price premium (or equity greenium) relative to poor (or not so good) ESG companies, which translates into lower expected returns and a high firm valuation. The potential to increase expected returns by investing in equities with high ESG scores depends on recognizing businesses where ESG risks are not yet adequately reflected in prices and selecting businesses that are in the ESG transition phase.

Table 2: Portfolio average return analysis

	Low-ESG-confidence portfolio (50%-50% Split)	High ESG-confidence portfolio (Top 25%-Bottom 25% Split)
High score portfolio	1.47%	1.38%
Low score portfolio	1.99%	1.65%
Hedge (High-Low)	-0.61%	-0.59%
Paired t-test	3.46***	0.80

Notes: The table provides average monthly returns of high-score, low-score, and hedge portfolios. ***, **, and * denote statistical significance at the 1%, 5% and 10% level respectively.

The paired t-test values reveal that the difference in mean values of the high and low-score portfolios is highly significant in the low ESG confidence portfolio.

Table 3: Low-ESG-Confidence portfolio (50%-50% split): Regression performance risk results

	α	β	SMB	HML	WML	F-Stat	Adj R^2	e^2_i
CAPM								
Low Ranked Portfolio	-0.5334***	0.0178***				56.52***	0.2976	0.3033
High Ranked Portfolio	-0.5389***	0.0167***				48.98***	0.2681	0.3125
Diff (High-Low)	-0.0061**	-0.0002				0.20	-0.0062	0.1588
Fama-French 3 Factor Model								
Low Ranked Portfolio	-0.5342***	0.0155***	0.0019	0.0033		19.35***	0.2959	0.2946
High Ranked Portfolio	-0.5399***	0.0151***	-0.0007	0.0030		16.67***	0.2641	0.3200
Diff (High-Low)	-0.0066***	0.0005	-0.0036***	0.0005		12.07***	0.2022	0.1443
Carhart 4 Factor Model								
Low Ranked Portfolio	-0.5347***	0.0156***	0.0019	0.0034	0.0003	14.41***	0.2904	0.2956
High Ranked Portfolio	-0.5403***	0.0152***	-0.0007	0.0031	0.0003	12.41***	0.2583	0.3215
Diff (High-Low)	-0.0055**	0.0002	-0.0037***	0.0001	-0.0008	9.60***	0.2081	0.1413

Notes: The Table provides the risk-adjusted returns of the hedge portfolio using the Capital Asset Pricing Model (CAPM), the Fama French (FF) model and the Fama French Carhart (FFC) for the ESG scores for the period between 2010 to 2020. The high-ranked (low-ranked) total ESG-formed portfolios represent our portfolio groups and Diff (H-L) are the difference portfolios. Adj R^2 and e_i^2 represent the adjusted R-squared measure and residual portfolio risk (considered as a measure of diversification efficiency. All regressions apply a Newey and West (1987) correction for heteroscedasticity and autocorrelation. ***, **, * indicate statistical significance at the 0.01, 0.05 and 0.10 levels, respectively.

The beta values in all the models are significantly close to zero for both low- and high-scored portfolios, indicating that there is almost zero systematic risk, and therefore the portfolios should generate returns close to a risk-free rate of return. The alpha values are significantly negative for all the portfolios, namely the high-scored, low-scored, and difference portfolios. The SMB values in both Fama-French and Carhart models for both high-scored (not significant) and difference (significant at the 1 percent level) portfolios are negative, showing that high-scored and differenced portfolios have a large capitalization bias. Diversification is measured using the residual risk measure (e^2i) in the market model, which suggests that diversification is almost the same in both low and high portfolios and higher in different portfolios.

Table 4 highlights the results of the high-ESG confidence portfolio. Like the low-ESG confidence portfolio, the beta values in all the models are significantly close to zero for both low- and high-scored portfolios, indicating that there is almost zero systematic risk and therefore the portfolios should generate returns close to a risk-free rate of return. The alpha values are significantly negative for high-scored, low-scored, and difference portfolios, like in the case of low-ESG confidence portfolios. The SMB values in both Fama-French and Carhart models for both high-scored (not significant) and difference (significant at the 1 percent level) portfolios are negative, showing that high-scored and differenced portfolios include large market-capitalized firms. The HML values for the differenced portfolio are negative and significant in both the Fama-French and Carhart models, indicating that the differenced portfolio is comprised of more growth firms. Diversification is measured using the residual risk measure (e^2_i) in the market model, which suggests that diversification is almost the same in both low and high portfolios and higher in different portfolios.

Table 4: Low-ESG-Confidence portfolio (top 25%-bottom 25% split): Regression performance risk results

	α	β	SMB	HML	WML	F-Stat	Adj R^2	e^2_i
CAPM								
Low Ranked Portfolio	-0.5371***	0.0168***				45.53***	0.2537	0.3092
High Ranked Portfolio	-0.5397***	0.0166***				48.03***	0.2642	0.3183
Diff (High-Low)	-0.0061***	-0.0013**				7.58***	0.0478	0.1177
Fama-French 3 Factor Model								
Low Ranked Portfolio	-0.5380***	0.0144***	0.0011	0.0035		15.63***	0.2510	0.3010
High Ranked Portfolio	-0.5407***	0.0157***	-0.0020	0.0024		16.36***	0.2602	0.3262
Diff (High-Low)	-0.0061***	0.0004	-0.0038***	-0.0010**		25.21***	0.3566	0.1004
Carhart 4 Factor Model								
Low Ranked Portfolio	-0.5378***	0.0144***	0.0011	0.0034	-0.0001	11.63***	0.2451	0.3005
High Ranked Portfolio	-0.5410***	0.0158***	-0.0020	0.0025	0.0002	12.17***	0.2544	0.3273
Diff (High-Low)	-0.0063**	0.0424	-0.0038***	-0.0010**	0.0001	18.78***	0.3518	0.1004

Notes: The Table provides the risk-adjusted returns of the hedge portfolio using the Capital Asset Pricing Model (CAPM), the Fama French (FF) model and the Fama French Carhart (FFC) for the ESG scores for the period between 2010 to 2020. The high-ranked (low-ranked) total ESG-formed portfolios represent our portfolio groups and Diff (H-L) are the difference portfolios. Adj R2 and ei2 represent the adjusted R-squared measure and residual portfolio risk (considered as a measure of diversification efficiency. All regressions apply a Newey and West (1987) correction for heteroscedasticity and autocorrelation. ***, **, * indicate statistical significance at the 0.01, 0.05 and 0.10 levels, respectively.

6. Conclusion and Discussion

Our findings have several implications for investors, policymakers, and researchers. First, on average, investor preference for ESG assets comes with the cost of lower expected future returns, which is only temporarily compensated by positive realized returns. Specifically, investors may expect to face a reduction in the expected return of about 2.73% on an annual basis. Such a reduction becomes even more pronounced when correcting the biased ESG premium, which translates to a decrease in expected returns of about 3.41% on an annual basis. Even if the difference between the two may seem rather small, it is worth mentioning that the decrease in expected returns tends to increase as investors: (1) tilt their portfolios even more towards stocks with the best ESG performance (e.g., by using a two standard deviation increase of the ESG characteristic instead of one), and (2) if they keep following such a strategy for a prolonged period. To put it concisely, the insights provided by our results may help investors better calibrate their needs in terms of both ESG and financial performance to allocate their portfolios optimally. The consequences faced by investors are of importance for policymakers too, especially in light of the new possibilities for pension funds to implement ESG criteria when allocating their portfolios. Our results indeed show that ESG investing cannot be seen as a free lunch, and policy aiming to make available ESG investments to a broader investor base should carefully consider the long-term implications behind the adoption of such policies.

Fama and French (2007) developed a simple framework that can be applied to determine how investors' preferences for green companies affect expected returns. They show that when utility functions, for at least some investors, include variables other than future consumption, prices deviate from the standard predictions of conventional risk and return models. If a subset of investors prefers to invest in green companies, the expected return from investing in greener companies will be lower, with the magnitude of the effect depending on the amount of money invested by the subset of investors. With upwards of $30 trillion of investment being affected by ESG considerations, the price impact is likely to be material. A more recent and detailed model developed by Pastor *et al.* (2020) reaches the same conclusion: if investors prefer green companies, the risk-adjusted expected returns on those companies will be less in equilibrium.

As an illustration of this effect, Hong and Kacperczyk (2009) and Dimson *et al.* (2015) studied what they call "sin" stocks, that is, companies involved in businesses such as producing alcohol, tobacco, and gaming. They hypothesize that these are stocks for which investors have negative tastes. Consistent with Fama and French's (2007) theory, both groups of authors find that sin stocks are less commonly held by institutions and that they have higher average returns than otherwise comparable stocks. They conclude that investors must be compensated in terms of a greater expected return for the reputational cost associated with holding sin stocks. The reverse would be true for highly rated ESG stocks, for which investors have a positive preference. Note that lower pecuniary risk-adjusted returns on ESG stocks do not mean that the "total" returns are lower. It depends on how the total return is defined. For investors that prefer investing in more socially responsible companies, holding stocks of highly rated ESG firms presumably results in a nonpecuniary benefit that increases the total return more broadly defined. Unfortunately, things get sticky when an intermediary, such as a pension fund, makes decisions for a large group of investors that have diverse preferences concerning ESG characteristics. Those investors with more muted preferences for holding socially responsible companies will be dissatisfied with lower expected returns.

Finally, if the ESG criteria are hard constraints, they must have a downward impact on investment performance compared to unconstrained investment portfolios. After all, an unconstrained investor can always choose to hold an ESG-constrained portfolio, but the reverse is not true. In addition, adding constraints limits portfolio diversification, which will negatively impact the risk-return trade-off.

The good side of the lower expected returns is an increase in the value of greener companies because of the lower discount rate. As Pastor *et al.* (2020) show, this has two desired social effects. First, firms choose to become greener because greener firms have greater market value. Second, investment shifts towards greener firms because of their lower cost of capital. It is worth noting that ESG advocates, on occasion, conflate these benefits with higher returns for investors. Unfortunately, the two are inconsistent. The bottom line is that if a sufficient number of investors have nonpecuniary preferences for companies with high ESG scores, that will lower the discount rate at which the companies' cash flows are discounted and thereby raise their value relative to that of companies with lower ESG scores. In addition, the lower discount rate produces an incentive for firms to go green to increase their value. It also means that holding cash flows constant, projects undertaken by high-ESG firms will have greater value than those undertaken by low-ESG firms. This shifts capital investments towards high-ESG firms. All these benefits, however, do not come without a cost. The cost is that investors in highly rated ESG companies can expect a lower rate of return on their investments.

In line with P´astor *et al.* (2021), our model predicts a negative relationship between the ESG rating and CAPM alpha when there is no uncertainty in ESG ratings. Negative return predictability stems from nonpecuniary benefits from holding green stocks. Studies show that companies with a strong environmental, social, and governance (ESG) profile are more competitive than their peers, as they use resources, human capital, and innovation more efficiently. High ESG-rated companies have lower exposure to systematic risk factors and a low expected cost of capital, leading to higher valuations in a DCF model framework. They are typically more transparent, particularly concerning their risk exposures, risk management, and governance standards, and have a better long-term vision.

ESG investing is becoming mainstream in global equity markets, driven by rising demand for investments that promote sustainability. Regulators require disclosure to evaluate the extent to which ESG alignment impacts portfolio performance. The UN PRI 2010 report states that "externalities can affect shareholder value because they lead to a

more uncertain, rapidly changing economic environment and greater systemic risks. Inefficient allocation of capital to highly polluting activities can cause a decline in asset values over time. For a diversified investor, environmental costs are unavoidable as they come back into the portfolio as insurance premiums, taxes, inflated input prices, and the physical costs associated with disasters. These costs could also reduce future cash flows and dividends. One company's externalities can damage the profitability of other portfolio companies, adversely affect other investments, and hence the overall market return. Ultimately, externalities caused by companies could significantly affect the value of capital markets or their growth potential, and with that, the value of diversified portfolios." In other words, the longer-term risks of climate change and resource scarcity can be offset by investment tilts or themes towards companies with ESG-favorable drivers that should help portfolios outperform over the long term. In general, existing literature shows that good corporate governance, sound environmental standards, and active engagement with stakeholders can create value for shareholders (Renneboog *et al.*, 2008).

Prior studies provide conclusive evidence that firms with better ESG scores tend to have lower costs of capital and enjoy higher valuations than firms with inferior ESG scores. Better ESG firms can borrow at lower interest rates, have a lower cost of equity capital, and enjoy higher market-to-book (M/B) equity values or Tobin's Q. In contrast, prior studies are far from conclusive about whether better ESG firms enjoy future higher returns, with some studies documenting higher future returns for better ESG firms, some documenting lower returns, and still others documenting no meaningful differences in returns. If indeed current valuations of better ESG firms are higher than those for companies with lower ESG scores, then their future returns should be lower than those of worse ESG firms, unless investors are less than completely rational in incorporating ESG into equity prices. Such mispricing can occur due to several specific reasons related to ESG.

Given that ESG considerations are now important for asset owners and individual investors, how can investment managers achieve those outcomes in portfolios? One way is to select companies with attractive underlying ESG profiles without regard to their risk and return characteristics. It depends entirely on whether highly rated ESG companies are properly priced. It does not mean that high ESG stocks have greater expected returns. If the market price of ESG risk is negative, as Lioui and Engel et al. find, then highly rated ESG stocks will have lower expected returns, ceteris paribus. It is theoretically possible that investment managers have failed to recognize ESG risks so that they are not properly priced. The possibility remains that highly rated ESG stocks will be mispriced for behavioural reasons.

References

Adams, C. A., & Abhayawansa, S. (2022). Connecting the COVID-19 pandemic, environmental, social and governance (ESG) investing and calls for 'harmonisation' of sustainability reporting. *Critical Perspectives on Accounting*, *82*, 102309.

Adler, T. A. (2008). The cost of socially responsible investing. *Journal of Portfolio Management*, *35*(1), 52-56.

Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. *Management science*, *65*(10), 4451-4469.

Ali, W. F. (2017). Determinants of corporate social responsibility (CSR) disclosure in developed and developing countries: A literature review. *Corporate Social Responsibility and Environmental Management*, *24*(4), 273-294.

Arbel, A. C. S. (1983). Giraffes, institutions and neglected firms. *Financial Analysts Journal*, 57–63.

Balvers, R., Du, D., & Zhao, X. (2017). Temperature shocks and the cost of equity capital: Implications for climate change perceptions. *Journal of Banking & Finance*, *77*, 18-34.

Barber, B. M., Morse, A., & Yasuda, A. (2021). Impact investing. *Journal of Financial Economics*, *139*(1), 162-185.

Barnett, M. L. (2007). Stakeholder influence capacity and the variability of financial returns to corporate social responsibility. *Academy of Management Review*, 794-816.

Bauer, R. J. (2007). The Ethical Mutual Fund Performance Debate: New Evidence from Canada. *Journal of Business Ethics 70(2)*, 111-124.

Bauer, R. K. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Bank. Finance, 29(7)*, 1751-1767.

Bauer, R. R. (2006). Ethical Investing in Australia: Is There a Financial Penalty? *Pacific-Basin Finance Journal 14(1)*, 33-48.

Beck, T., Chen, T., Lin, C., & Song, F. M. (2016). Financial innovation: The bright and the dark sides. *Journal of Banking & Finance*, *72*, 28-51.

Beloskar, V. D., & Rao, S. N. (2023). Did ESG save the day? Evidence from India during the COVID-19 crisis. *Asia-Pacific Financial Markets*, *30*(1), 73-107.

Blitz, D., & Fabozzi, F. J. (2017). Sin stocks revisited:Resolving the sin stock anomaly. *The Journal of Portfolio Management*, 105–11.

Bolton, P. A. (2021). Do investors care about carbon risk?. *Journal of Financial Economics*, *142*(2), 517-549.

Bowen, F. A.-C. (2014). Greenwashing in corporate environmentalism research and practice: The importance of what we say and do. *Organisation & Environment*, 107–112.

Brammer, S, B. C. (2006). Corporate social performance and stock returns: UK evidence from disaggregate measures. *Financial Management*, *35*, 97-116.

Byun, H. S. (2008). The Implied Cost of Equity Capital and Corporate Governance Practices. *Asia-Pacific Journal of Financial Studies*, 139–84.

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, *52*, 57–82.

Chadha, S. (2023, October 04). Explained: Is Nifty500 index a worthy bet for passive investors? *Business Standard*.

Chan, M. F., Phua, L. K., & Jalaludin, D. (2022). ESG performance and value relevance of accounting information: Evidence from chinese capital market. *International Journal of Accounting, Finance and Business*, *7*(43).

Cheng, J. T., Tracy, J. L., Foulsham, T., Kingstone, A., & Henrich, J. (2013). Two ways to the top: Evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. *Journal of personality and social psychology*, *104*(1), 103.

Chow, G. W., Durand, R., & Koh, S. (2014). Are ehical investments good?. *Australian Journal of Management*, *39*(4), 645-665.

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

Clark, J., Mauck, N., & Pruitt, S. W. (2021). The financial impact of COVID-19: Evidence from an event study of global hospitality firms. *Research in International Business and Finance*, *58*, 101452.

Crisil. (2021, June 28). *CRISIL launches ESG scores of 225 companies*. Retrieved from https://www.crisil.com/en/home/newsroom/press-releases/2021/06/crisil-launches-esg-scores-of-225-companies.html

Daugaard, D. (2019). Emerging new themes in environmental, social and governance investing: A systematic literature review. *Accounting and Finance*, 1501-1530.

Derwall, J., Koedijk, K., & Ter Horst, J. (2011). A tale of values-driven and profit-seeking social investors. *Journal of Banking & Finance*, *35*(8), 2137-2147.

Dimson, E., Rousseau, P. L., & Spaenjers, C. (2015). The price of wine. *Journal of Financial Economics*, *118*(2), 431-449.

Dunn, J., Fitzgibbons, S., & Pomorski, L. (2018). Assessing risk through environmental, social and governance exposures. *Journal of Investment Management*, *16*(1), 4-17.

Engle, R. F., Ledoit, O., & Wolf, M. (2019). Large dynamic covariance matrices. *Journal of Business & Economic Statistics*, *37*(2), 363-375.

Fabozzi, F. J. (2008). Sin stock returns. *The Journal of Portfolio Management*, *35*(1), 82-94.

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*, *25*(2).

Fama, E. F. (1992). The cross-section of expected stock returns. *The Journal of Finance*, *47*, 427–465.

Fama, E. F. (2015). A five-factor asset pricing model. *Journal of Financial Economics*, *116*, 1–22.

Fama, E. F., & French, K. R. (2007). Disagreement, tastes, and asset prices. *Journal of Financial Economics*, *83*(3), 667-689.

Friedman, M. (1970, September 13). The social responsibility of business is to increase its profits. *New York Times Magazine*.

Fulton, M., Kahn, B., & Sharples, C. (2012). Sustainable investing: Establishing long-term value and performance. *Available at SSRN 2222740*.

Galbreath, J. (2013). ESG in focus: The Australian evidence. *Journal of Business Ethics*, *118*, 529-541.

Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, *66*, 101889.

Governance& Accountability Institute. (2018). Retrieved from https://www.ga-institute.com/research/research/sustainability-reporting-trends/#:~:text=The%20G%26A%20research%20team%20determined,declined%20to%20publish%20sustainability%20reports.

Grewal, J., Riedl, E., & Serafeim, G. (2017). Market reaction to mandatory nonfinancial disclosure. *Management Science*, *65*.

Hale, J. (2018, September 21). *Sustainable Investing Events highlight Kofi Annan's legacy.* The ESG Advisor. Retrieved from https://medium.com/the-esg-advisor/sustainable-investing-events-highlight-kofi-annans-legacy-a34d966500ff

Hoepner, A. G., Kant, B., Scholtens, B., & Yu, P. S. (2013). Is the journal Ecological Economics really in itself a poor and misleading guide to what ecological economics is about? A reply to "Influencing the perception of what and who is important in ecological economics". *Ecological Economics*, *89*, 174-176.

Hong, H., & Kacperczyk, M. (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, *93*(1), 15-36.

Humphrey, J. E. (2012). The independent effects of environmental, social and governance initiatives on the performance of UK firms. *Australian Journal of Management*, 135-151.

Karl, F., & Inderfurh, P. K. (2013, January 2). *India's Emerging Economy: Sector by Sector*. Centre for strategic & International studies. Retrieved from https://www.csis.org/analysis/india's-emerging-economy-sector-sector

Khan, M. (2019). Corporate governance, ESG, and stock returns around the world. Financial Analysts Journal,75(4), 103-123.

Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate Sustainability: First Evidence on Materiality. *SSRN Electronic Journal*.

Kim, E. -H. (2015). Greenwash vs. brownwash: Exaggeration and undue modesty in corporate sustainability disclosure. *Organization Science*, *26*, 705–723.

Koh, S., Limkriangkrai, M., & Durand, R. B. (2016). Environmental, social, and governance (ESG) profiles, stock returns, and financial policy: Australian evidence. *International Review of Finance*, *17*(3).

Lee, D. D., Fan, J. H., & Wong, V. S. (2021). No more excuses! Performance of ESG-integrated portfolios in Australia. *Accounting & Finance*, *61*, 2407-2450.

Li, F., & Polychronopoulos, A. (2020). What a difference an ESG ratings provider makes. *Research Affiliates*, *24*, 1-15.

Lovas, A. (2015). The risk of adverse selection and its management in the process of venture capital investment (The experience of Hungarian investors). *Economy and Finance*, *2*(2), 186-202.

Luo, D. (2022). ESG, liquidity, and stock returns. *Journal of International Financial Markets, Institutions and Money*, *78*,101526.

Managi, S. O. (2012). Do socially responsible investment indexes outperform conventional indexes?. *Applied Financial Economics*, *22*(18), 1511-1527.

McDonald, F. A. (2014). International variation in sin stocks and its effects on equity valuation. *Journal of Corporate Finance*, *25*.

Mohammad, W. M., & Wasiuzzaman, S. (2021). Environmental, social and governance (ESG) disclosure, competitive advantage and performance of firms in Malaysia. *Cleaner Environmental Systems*, *2*, 100015.

Muhammad Naeem, D. H. (2021). The impact of ESG practices on firm performance: Evidence from emerging countries. *Indian Journal of Economics and Business*, *20*(1), 731-750.

Naffa, H. A. (2022). A factor approach to the performance of ESG leaders and laggards. *Finance Research Letters*, *44*, 102073.

Oikonomou, I., Brooks, C., & Pavelin, S. (2012). The impact of corporate social performance on financial risk and utility: A longitudinal analysis. *Financial Management*, *41*(2), 483-515.

Pástor, L. S. (2021(a)). Sustainable Investing in Equilibrium. *J. Financial Econ. 142 (2)*, 550-571.

Pástor, Ľ., Stambaugh, R. F., & Taylor, L. A. (2020). Fund tradeoffs. *Journal of Financial Economics*, *138*(3), 614-634.

Pástor, Ľ., Stambaugh, R. F., & Taylor, L. A. (2021). Sustainable investing in equilibrium. *Journal of Financial Economics*, *142*(2), 550-571.

Plagge, J.-C. A. (2020). Have investors paid a performance price? Examining the behavior of ESG equity funds. *The Journal of Portfolio Management*, 123-140.

Powell, R. (2021, December 3). *How will the rise of ESG affect stock market returns?*. Retrieved from https://www.evidenceinvestor.com/how-will-the-rise-of-esg-affect-stock-returns/

RBC Global Asset Management Company. (2019). *Responsible Investing Survey*. Retrieved fromhttps://global.rbcgam.com/sitefiles/live/documents/pdf/rbc-gam-responsible-investing-survey-key-findings-2019.pdf

Reeneboog, M. E. (1987). A simple model of capital market equilibrium with incomplete information. *Journal of Finance*, *42*, 483-510.

Renneboog, L., Ter Horst, J., & Zhang, C. (2008). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking & Finance*, *32*(9), 1723-1742.

Renneboog, L., Ter Horst, J., & Zhang, C. (2011). Is ethical money financially smart? Nonfinancial attributes and money flows of socially responsible investment funds. *Journal of Financial Intermediation*, *20*(4), 562-588.

Revelli, C. A. (2015). Financial performance of socially responsible investing (SRI): What have we learned? A meta-analysis. *Business Ethics: A European Review*, *24*, 158–185.

Sanyal, S. (2023, December 13). Five reasons why India stocks are rallying and could keep going. *CNBC*.

Serafeim, G. (2020). Public sentiment and the price of corporate sustainability. *Financial Analysts Journal*, *76*(2), 26-46.

Sherwood, M. W., & Pollard, J. L. (2018). The risk-adjusted return potential of integrating ESG strategies into emerging market equities. *Journal of Sustainable Finance & Investment*, *8*(1), 26-44.

Statman, M. A. (2006). Socially responsible indexes. *The Journal of Portfolio Management*, 100-109.

Statman, M., & Glushkov, D. (2009). Equity investments: Research sources; investment theory: Efficient market theory; Portfolio management: Equity strategies. *Financial Analysts Journal*, *65*(4).

Suttipun, M. (2021). The influence of board composition on environmental, social and governance (ESG) disclosure on Thai listed companies. *International Journal of Disclosure and Governance*, 391-402.

Switzer, L. N. (2018). Corporate governance and default risk in financial firms over the post-financial crisis period: International evidence. *Journal of International Financial Markets, Institutions and Money*.

Will, K. (2022, April 14). *Sin Stock*. Retrieved from https://www.investopedia.com/terms/s/sinfulstock.asp#:~:text=Key%20Takeaways-,A%20sin%20stock%20is%20a%20publicly%20traded%20company%20involved%20in,related%20industries%2C%20and%20weapons%20manufacturers.