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Does Money Really Grow on Trees?

A comparative study on ESG and stock performance in Sweden and India

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Abstract

The interplay between ESG scores and stock performance continues to captivate investors and researchers alike, yet consensus remains elusive; highlighting the need for further academic endeavour. This thesis investigates the impact of a company's ESG score on its stock performance in terms of expected returns. Specifically, it examines disparities in this relationship between two case countries: Sweden and India, representing a developed and an emerging market, respectively. The study contributes to existing literature by comparing two countries at different stages in their ESG journey, supporting scholar's recent pursuit in closing the gap in the research field examining emerging markets. The relationship is explored by using multifactor asset-pricing models and panel data regression analysis on ESG-rated portfolios with data from 2015-2022. The results indicate that 1) low-ESG portfolios outperform high-ESG portfolios in both Sweden and India, 2) Swedish low-ESG portfolios outperform Indian low-ESG portfolios, and 3) Swedish high-ESG portfolios underperform Indian high-ESG portfolios. This study demonstrates that the relationship between ESG scores and expected returns is stronger in Sweden than in India, suggesting differences in investor behaviour and ESG investing between the two countries. The results from this study can add a piece to the complex and disputed puzzle of SRI, serving as a stepping stone for future research on the relationship between ESG and stock returns in developed and emerging markets. For practice, the results are valuable for several stakeholders, including investors, companies, and policymakers who can utilise this information to integrate ESG into investment strategies, corporate strategies, and promote efficient financial markets.

Keywords: *ESG, stock performance, sustainable investing, socially responsible investing, expected returns, developed markets, emerging markets*

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Abbreviations

Abbreviation	Definition
CSR	Corporate Social Responsibility
SRI	Socially Responsible Investing
ESG	Environmental, Social, and Governance
CAPM	The Capital Asset Pricing Model
ME	market equity
BE/ME	book-to-market equity
SMB	Small Minus Big
HML	High Minus Low
MOM	Momentum
RMW	Profitability
CMA	Investments
CSV	Creating Shared Value
GDP	Gross Domestic Product
VIF	Variance Inflation Factor
SEBI	Securities and Exchange Board of India
BRR	The Business Responsibility Report

1. Introduction

This introductory chapter begins by giving a background of the study and introduces the research gap. Additionally, the primary aims, objectives, research purpose and delimitations that guide the study will be outlined. Lastly, an outline is provided in order to bring clarity to the structure of the thesis.

1.1 Background

It has long been assumed that the sole interest of shareholders is to maximise profits (Friedman, 1970). However, echoing the heightened significance of Corporate Social Responsibility (CSR), investors have become increasingly compelled to look beyond mere financial gains when making investment decisions. Surpassing $30 trillion sustainable assets globally in 2022 (Bloomberg, 2024), the phenomena of Socially Responsible Investing (SRI) has received considerable attention in both academia and practice. SRI emerged in the 1970s as a concept embodying and promoting investment behaviour prioritising ethical, socially, and environmentally responsible business practices (Krantz, 2024; Renneboog et al. 2008). As sustainability continued to gain momentum, the UN published the Principles for Responsible Investment in 2006, advocating for the importance of Environmental (E), Social (S), and Governance (G) (ESG) activities in financial reporting and decision-making.

The increased recognition of ESG practices led to the rise of ESG ratings and rating agencies, which grew from catering to highly specialised investor clientele to serving the mainstream market (Berg et al. 2022). In later years, the demand from investors for indicators beyond conventional financial metrics has driven the creation of over 500 ESG rating systems (Avetisyan & Hockerts, 2017). Major players such as Thomson Reuters, Bloomberg, and the Morgan Stanley Capital Index have adopted these ratings to assess corporate sustainability efforts through ESG evaluations. Nonetheless, while it is essential to recognise that ESG ratings can be influenced by biases, Papoutsi and Sodhi (2020) point out that a significant positive link still exists between the

sustainability information disclosed by companies and their actual sustainability performance. Drawing from voluntary disclosure theory (e.g. Verrecchia, 1983; Dye 1985), one could, therefore, assume that a firm's engagement with ESG initiatives may predict its commitment to ESG reporting practice in which the better the ESG performance of a firm, the more extensive their reporting should be. On the whole, the framework serves as a way for firms to signal their ESG performance, distinguishing themselves from firms with poor ESG practices to avoid adverse selection (Akerlof, 1970).

Two primary drivers seem to underpin the shift in investor preference towards ESG (Renneboog et al. 2008). Firstly, there is a heightened interest in companies that embrace ethical practices (Baldini et al. 2018; Broadstock et al. 2021), spurred by investors' altered expectations. Secondly, there is a perception that ESG investments can reduce risk and increase financial performance (Whelan et al. 2021; Zhai et al. 2022). Irrespective of rationale, SRI and ESG have undoubtedly emerged as key strategies for investors to align their investments with their ethical values (Renneboog et al. 2008). Yet, the question of the economic viability of SRI has been highly debated, centring around the core issue of what Benjamin Franklin once phrased as "doing well by doing good". In other words, does SRI provide additional financial benefits for the investor, rather than merely catering to ethical concerns? Or do ethical investors have to compromise financial returns for their values?

1.2 Problematisation

Despite the growing literature on the relationship between ESG and financial performance, the findings are inconclusive (Cornell & Damodaran, 2020; Margolis et al. 2009; von Wallis & Klein, 2015). While some researchers identify a positive relationship between ESG and financial performance (e.g., Eccles et al. 2014; Fatemi et al. 2015; Porter & Kramer, 2011), others find a negative one (e.g., Chava, 2014; Hong & Kacperczyk 2009; Renneboog et al. 2008). Moreover, much of the research suggests a neutral relationship (e.g., Halbritter & Dorfleitner, 2015; von Wallis & Klein, 2015).

The lack of consensus is further underscored when it comes to research on emerging markets, where the literature is far from exhaustive. Notably, over 85% of the research and meta-analyses on this topic cover developed markets (Clark et al. 2014), creating a considerable gap in the literature concerning emerging ones. Additionally, emerging markets are expected to play a key role in fuelling global economic growth (Odell & Usman, 2016), further stressing the importance of their inclusion in the literature. Given their different market dynamics and institutional frameworks, the underrepresentation of emerging markets in ESG literature is a critical oversight. Following the discourse on the relationship between ESG and financial performance and its inconclusive results, a new question arises: Could the geographical region of companies add another layer to the dynamics of ESG and financial performance?

There are currently two prominent research approaches dominating the field of ESG and financial performance: 1) a market-oriented stand, which looks at stock performance (Hong & Kacperczyk, 2009; Renneboog et al. 2008) and 2) an accounting-oriented stand using measures such as return on asset, return on equity, and Tobin's Q (e.g., Gillan et al. 2010; Iliev & Roth, 2021). In essence, an accounting-based approach is essential for understanding a firm's operational performance, whereas a market-based approach allows for a better understanding of how the operations are perceived and valued by the broader market (Garcia-Blandon et al. 2020). For the context of this study, a market-oriented view will be adopted.

The market-oriented approach not only enriches academic research but also offers valuable insights for the financial industry. With the global increase in sustainable investing (Bloomberg, 2024), understanding the complex relationship of ESG and stock performance has become a highly relevant practical problem. Although existing research remains inconclusive on the relationship, financial institutions are seeking to improve returns through ESG investing (Dyck et al. 2019). Moreover, many fund managers seem to believe that sustainable practices as positively related to future financial performance (Hartzmark & Sussman, 2019). However, the lack of definite conclusions in the literature can lead to less informed investment decisions in practice.

According to Cornell (2020), the inconclusive research on ESG and stock performance is not surprising. Given that ESG is a relatively new phenomenon, especially within emerging markets, he argues that enough time might not have passed for all ESG considerations to be fully incorporated into the stock price. Interestingly, Cornell finds that high ESG stocks should outperform low ESG stocks during what he refers to as an "adjustment period", whereas the opposite should hold true once the market has reached equilibrium. It should therefore be interesting to analyse how the integration of ESG into asset prices differs depending on which financial market is investigated and how far this market is from reaching price equilibrium. In order to do so, this study will look into the markets of Sweden and India, using them as case studies for a developed and an emerging market. Since these two countries serve as cases, the findings may not fully capture the dynamics of their respective market categories. Instead, they serve as pieces of a larger puzzle in mapping the ESG-stock performance relationship in both developed and emerging markets. This leads us to the research question of this paper:

To what extent does the ESG rating impact the stock performance of companies in Sweden, representing a developed market, compared to India, representing an emerging market?

1.3 Objectives and Research Purpose

This thesis aims to investigate whether a company's ESG score impacts stock performance in terms of stock returns. More specifically, the paper seeks to determine whether there are disparities in this relationship between Sweden, a developed market, and India, an emerging market. In order to achieve this, the study seeks to capture and analyse the relationship through the utilisation of asset-pricing models. This will be done by conducting a panel data regression analysis on ESG-rated portfolios of stocks in the two respective countries.

While literature is abundant on ESG and stock performance in developed markets, emerging markets have received little attention. To the best of our knowledge, this paper will be the first to conduct a panel data case-study on Sweden and India. Moreover, the study adds to the literature by using the most recent ESG scores available from Bloomberg. This is especially relevant since

the sample period plays an integral part in looking at the effect of ESG integration in the market. By using a case study, the thesis hopes to shed new light on the research problem by challenging assisting assumptions in the inconclusive field and opening up new directions for future research.

Another rationale for selecting Sweden and India as the two case countries lies in their distinctive ESG trajectories. Sweden, a European country at the forefront of ESG adaptation and integration, and India, a developing market still in the early stages of ESG integration, provide contrasting contexts that can illuminate significant differences. This is especially interesting as the countries would illustrate the effect of ESG ratings on stock performance in different periods of a market's ESG development. From an investor perspective, the findings of this paper could assist in understanding how to incorporate ESG considerations into their decision-making process. Firms may also find the results valuable as they highlight the implications of ESG initiatives. Additionally, the findings may assist policymakers in creating a legal and regulatory framework to address the role that companies play in societal challenges, such as climate change.

1.4 Delimitations

Several delimitations have been included in this study to narrow the scope. First of all, this thesis takes a case study approach, selecting Sweden and India to represent a developed and emerging market, respectively. The aim, however, is not to generalise findings across all developed and emerging markets but rather to contribute with a significant piece to the broader body of existing literature. Additionally, there is an inherent complexity in determining the effect that a firm’s ESG score has on its stock performance. The reason for this is that stock performance is not only determined by the firm's intrinsic value but also highly affected by investor behaviour. For this reason, it can be difficult to know what is being tested, especially if different research approaches are employed without a proper distinction between the two (Cornell & Damodaran, 2020). Although several studies have chosen to employ both methods, this was deemed beyond the scope of this paper. This study will therefore, limit itself to solely adopting a market-based approach when investigating the dynamics of ESG and stock performance.

This research will be conducted on publicly listed companies on the large and mid-cap Swedish Nasdaq and the Nifty 500 stock exchanges. Large, public companies are chosen due to the availability of data on returns and ESG scores. In addition, data from 2015-2022 will be used. This is because the Bloomberg ESG score was first introduced in 2015, and ESG data has not been updated since 2022. Moreover, with access to a diverse set of ESG scoring databases, the decision to solely collect ESG data from Bloomberg represents a further delimitation.

1.5 Disposition of the Study

In the next section, financial theories and models will be introduced, primarily focusing on the risk-return relationship of stocks. Moreover, the chapter deep dives into sustainable finance theories, discussing the meaning and purpose of ESG and how it impacts shareholders and stakeholders alike. Towards the end of the theoretical review, previous related research on the relationship between ESG and stock performance, particularly within the context of developed and emerging markets, lays the foundation for hypothesis development. In chapter three, the choice of methodology is covered, which is directly linked to chapter four, where the results of the paper are presented. Then, section five analyses how the results of the paper connect to theory and empirical research. Finally, chapter six concludes the paper by suggesting implications for future research, while also addressing potential shortcomings.

2. Theoretical Review

The literature review is divided into three sections: financial models, sustainable finance theories, and hypothesis development. To begin with, a selection of multifactor pricing models commonly used to calculate an investment's expected returns based on fundamental risk-return assumptions will be introduced. Secondly, previous research on sustainable investing is presented, aiming to shed light on how investor behaviour shapes stock market dynamics. Next, an analysis of the inherent differences between the two countries of Sweden and India within the context of ESG and stock performance will be discussed. Finally, towards the end of the literature review, hypotheses will be developed.

2.1 Financial Models

In order to analyse the impact of ESG disclosures on expected returns, this paper adopts the following financial models: The Efficient Market Hypothesis, Jensen's Alpha, the Capital Asset Pricing Model, the Fama French Three-Factor Model, Charhart's Four-factor Model, and the Fama French Five-Factor Model. Before diving into these models, it should be noted that a fundamental assumption in finance theory is that excess returns can stem from either 1) taking on more risk, 2) investor behaviour, or 3) market impediments (Cornell, 2020). Assuming that the secondary market in which the stocks are traded is active, this paper will primarily focus on risk and behavioural factors.

2.1.1. The Efficient Market Hypothesis

The efficient market hypothesis is a fundamental theory within financial market analysis on which most of the following finance theories are built. This theory states that the prices of all securities fully reflect all available information and that it is impossible to continuously "beat" the market (Fama, 1970). To clarify, in the short term, realised returns may vary, but in the long term, realised returns should equal expected returns (Fama, 1991). This is because when news is released, this information will quickly spread and be incorporated into the financial market until the share prices stabilise to fully reflect the information (Malkiel, 2003).

However, the underlying assumptions of this theory can complicate its practical application as it assumes perfect markets with no transaction costs, that all investors are completely rational, and that all information is equally distributed. Critics often state how irrational investor behaviour can lead to predictable stock returns, thus providing arbitrage opportunities (Malkiel, 2003). However, Malkiel (2003) counters such arguments by stating how pricing irregularities and patterns are short-lived and unlikely to provide investors with extraordinary returns. Nonetheless, as Grossman and Stiglitz (1980) eloquently stress, the financial market cannot be perfectly efficient, or else there would be no incentive to uncover information and incorporate it into the share price.

Without diving into existential questions of the stock market, Malkiel (2003) underlines how the most convincing argument for efficient financial markets is based on studies finding that active professional investment managers do not vastly outperform well-distributed passive investments (see Jensen, 1968). This makes the efficient market hypothesis a framework worth mentioning in the context of ESG and the potential of excess returns. Upon applying the theory, if a higher ESG score signals metrics such as performance, such information would be incorporated into the stock price (Cornell & Damodaran, 2020). Nonetheless, the limitations to the efficient market hypothesis are worth considering since the financial models that will subsequently be presented are grounded in the efficient market assumptions.

2.1.2 Jensen's Alpha

Jensen's alpha (1968) is a risk-adjusted performance measure that shows the average return of a portfolio relative to the predictive capital asset pricing model. This means that when an investor manages to beat the market with a portfolio or investment, the investor has a positive alpha and is earning excess returns. Conversely, a negative alpha means that the investment is underperforming the market returns, and an alpha of 0 indicates that the market is in equilibrium and there is no mispricing (Jensen, 1968). Essentially, to account for the market imperfections that are not incorporated into the risk-return profile of an investment, alpha is used to explain the extent of this deviation. The expected returns that cannot be accounted for in asset-pricing models are explained by alpha and can include explanations that derive from additional risk factors or investor behaviour (Fama & French, 1993; Fama & French, 2007).

Jensen's alpha formula: $ai = ri - [rf + \beta i(rm - rf)]$

Where:

a_i = Portfolio alpha

r_i = expected return of the portfolio

rf = risk-free rate

β_i = portfolio beta

r_m = expected return of the market

2.1.3 Capital Asset Pricing Model

The Capital Asset Pricing Model (CAPM) is one of the earliest asset pricing models used for calculating the expected return of a stock based on its volatility against the market and the expected return of a risk-free asset and a market portfolio (Lintner, 1965; Sharpe, 1964). Similarly to the efficient market hypothesis, the CAPM is based on three underlying assumptions explained by Berk and DeMarzo:

> (1) Investors can buy and sell all securities at competitive market prices (without incurring taxes or transaction costs) and can borrow and lend at the risk-free interest rate.
>
> (2) Investors hold only efficient portfolios of traded securities—portfolios that yield the maximum expected return for a given level of volatility.
>
> (3) Investors have homogeneous expectations regarding the volatilities, correlations, and expected returns of securities (2019, pp. 421-422).

CAPM formula: $ri = rf + \beta i[E(rm) - rf]$

Where:

r_i = Expected return on stock

rf = Risk-free rate i.e return of a risk-free investment

β_i= Volatility/sensitivity of the stock benchmarked against the market

$E(r_m)$ = Expected return of the market

Ansari (2000) explains how the main intuition of the model is that the higher the risk of a stock, the higher the expected return, which is due to two types of risk. First is the risk associated with the specific stock, systematic risk, and is noted with a beta coefficient (β) in the formula. The second risk is the unsystematic risk, or the market risk premium, and is denoted by $[E(r_m) - rf]$ in the equation (Ansari, 2000). One cannot eliminate the investment's exposure to the market risk, even if all stocks are purchased (Ansari, 2000). The expected returns are, therefore, the risk-free rate plus the stock β multiplied by the $[E(r_m) - rf]$ market risk premium. This product illustrates the sensitivity of the stock against the fluctuations in returns of a well-diversified market portfolio less the returns of a risk-free investment $[E(r_m) - rf]$.

2.1.4 Fama-French Three-Factor Model

Strong evidence against the CAPM due to the lack of explanatory power of a single-factor model has led to the development of many multiple-factor models (see Carhart, 1997; Fama & French, 1993; Fama & French, 2015; Pástor & Stambaugh, 2003). The Fama and French 3 factor model expands CAPM to include not only excess returns but also the risk factors of size and value, which Fama and French (1993) saw to have explanatory power based on the research by Banz (1981), Bhandari (1988) and Basu (1983), among others. This research on which the 3-factor model was based led to the variables market equity (ME) and book-to-market equity (BE/ME) being added to the CAPM formula (Fama & French, 1993).

Three-factor formula: $ri = rf + ai + \beta(rm - rf) + \beta sSMB + \beta vHML$

Where:

β_s, β_v= Portfolio beta

SMB = The difference in return between a portfolio containing small firms compared to large firms with the same average weighted value

HML = The difference in return between a portfolio with a high book-to-market ratio compared to one with a low book-to-market ratio

a_i = The intercept value for alpha

Fama and French (1993) included market equity because the research they looked at found that small companies had higher risk-adjusted returns than larger ones. This is denoted in the 3-factor formula as SMB (Small Minus Big), which in its application signifies the subtraction of the returns of the smallest firms with the returns of the largest firms in the portfolio (Fama & French, 1993). The effect of the firms' book value over market value (BE/ME) was that firms with a higher ratio had higher average returns. The stocks in which the book value is relatively higher than its market value tend to be called value firms that are mature, stable, and are undervalued. If the opposite case is true, such stocks are called growth firms, implying that the expected growth trajectory of the firm has led to a valuation higher than its book value. The higher average return in value companies compared to growth companies is denoted in the 3-factor CAPM as High Minus Low (HML).

2.1.5 Carhart's Four-Factor Model

Carhart (1997) extends the 3-factor model to include momentum in addition to size and value when determining the return of a security or portfolio. Momentum (MOM) is depicted as winners minus losers on the one-year past returns depending on whether the firm is positively or negatively advancing. What Carhart (1997) found was that funds with high returns the previous year had higher returns than average the following year but not in the long term and that investment costs had a negative effect on performance.

Four-factor formula: $ri = rf + ai + \beta(rm - rf) + \beta sSMB + \beta vHML + \beta momMOM$

Where:

βmom = Portfolio beta

MOM = the difference in return between a portfolio of the previous year's high-performing and low-performing companies

2.1.6 Fama-French Five-Factor Model

In 2015, Fama and French extended their 3-factor model to further include the variables of profitability (RMW) and investments (CMA) to better explain the variability of stock returns. The profitability factor explains how highly profitable companies tend to outperform less profitable firms. Profitability (RMW) is measured by the difference in excess returns between a firm with high operating profitability and those with low (Fama & French, 2015). Investments were found to hold an explanatory power since firms with high investment in profitable projects generate higher future cash flows and, therefore, higher returns (Fama & French, 2015). Investments (CMA) are measured as the excess returns of low asset growth companies over high asset growth companies.

Five-factor formula: $ri = rf + ai + \beta(rm - rf) + \beta sSMB + \beta vHML + \beta rRMW + \beta cCMA$

Where:

βr, βc = portfolio beta

RMW = Robust Minus Weak is the average return on the robust operating profitability portfolios minus the average return on the weak operating profitability portfolios

CMA = Conservative Minus Aggressive is the average return on the conservative investment portfolios minus the average return on the aggressive investment portfolios

2.2 Sustainable Finance Theories

The next section explores the intersection of finance theory and sustainability theory, presenting theoretical perspectives on the aforementioned financial models in the context of sustainability. It concludes with a discussion of the opposing views of shareholder theory and stakeholder theory, boiling down the ongoing debate within the field to its early sources. Lastly, the section examines Porter and Kramer's Shared Value Theory.

2.2.1 Fama French's Framework on Investor Disagreement

Fama and French (2007) critique asset pricing models for unrealistically assuming that investors agree on the probability distribution of future returns and that they are solely guided by expected payoffs. They therefore analyse how the CAPM model and expected stock returns are affected by investor disagreement. The CAPM theory, as outlined by Lintner (1969), assumes that asset prices depend on the weighted average of investors' expected payoff. However, Fama and French (2007) discovered that disagreements in what is considered a "good" company can cause significant deviations in the expected returns from the risk-return models presented above.

2.2.2 Cornell's ESG Pricing Adjustment Period Theory

A critique of Fama and French's investor disagreement framework (2007) is that it assumes that the market has reached price equilibrium. Cornell (2020) argues that the market equilibrium is not necessarily reached due to the novelty of ESG considerations. He suggests that until ESG is fully incorporated into the stock price, there will be an adjustment period in which assets are mispriced. During the adjustment period, contrary to what is proposed by Fama and French, high ESG stocks will tend to outperform low ESG stocks due to lower discount rates (Cornell, 2020). In turn, this implies that for a highly ESG-rated firm to be a superior investment, there needs to be market mispricing (Cornell, 2020; Cornell & Damodaran, 2020).

In essence, Cornell's framework on price equilibrium indicates that the relationship discovered when researching ESG and stock performance largely depends on the market's position in the adjustment period. Consequently, the timing of selecting a sample becomes crucial, as variations in proximity to price equilibrium could yield conflicting results. This is because, once the adjustment period concludes, high-ESG stocks should observe lower average returns (Cornell, 2020). As a result, Cornell suggests that the heterogeneous nature of current empirical research on ESG and stock performance most likely can be attributed to this adjustment period.

2.2.3 Shareholder Theory and Stakeholder Theory

Significant progress has been made in the areas of social responsibility, ESG, and CSR among both individual investors and corporations; however, the true impact of these sustainable practices on corporate financial performance is highly contentious, especially between proponents of shareholder and stakeholder theories. These two theories are often recognized as the foundation of which much sustainable finance research has originated from, which makes them important to understand before moving into the empirical research of the field.

Neoclassical economic theory suggests that employing sustainable practices could increase costs for firms, which may undermine their competitive advantage (Friedman, 1970). According to Friedman's shareholder theory (1962), a company's chief aim should be to maximise profits, which, as he asserts, aligns with its social responsibility (Friedman, 1970). From this perspective, undertaking socially responsible initiatives or addressing societal obligations, can incur costs that lower profitability and thus, should be avoided. Conversely, Freeman (1984), often considered the founder of stakeholder theory, posits that carefully managing stakeholder relationships can fortify a company's reputation and reduce the effects of negative regulations (Jensen, 2002). Therefore, companies should aim to generate value not only for shareholders, but also for employees, suppliers, customers, and communities. Then, by taking such action, firms will ultimately enhance their competitive advantage (Freeman, 1984; McVea & Freeman, 2005).

Similarly, as Freeman, other advocates have suggested that integrating sustainability practices can lead to a competitive advantage (Bernardi & Stark, 2018). For example, Li et al. (2018) and Cho (2022) each postulate that sustainable practices can add value to operations by aligning firm actions with stakeholder expectations, especially for firms that achieve higher profitability and better social outcomes through effective governance (Ferrell et al. 2016). According to Clark et al. (2014), the benefits of adopting sustainability practices for competitive advantage can be categorised into three main areas: *Risk management, efficiency gains,* and *reputation enhancement*.

2.2.4 Shared Value Theory

Shared Value, or Creating Shared Value (CSV) was introduced by Porter and Kramer (2006) as a more comprehensive approach to capitalism that seeks to govern the interaction between firms and society (Michelini & Fiorentino, 2012). The concept was developed as a response to the concept of CSR, which Porter and Kramer criticised for oftentimes being unproductive and poorly aligned with corporate strategies. Instead, they advocated for a more integrated, long-term strategy where the creation of shared value comes into play. They defined shared value as "...policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the community in which it operates" (2011, p. 66). Unlike traditional perspectives that place social issues on the periphery, CSV is built on the assumption that economic and social development are interdependent, and each can be incorporated in corporate strategy to create value that outweighs costs (Porter & Kramer, 2011).

Porter and Kramer's principal vision of CSV is that it can restore declining social trust in firms by fostering a positive relationship between businesses and society, aligning the interests of shareholders with social advantages (Dembek et al. 2016). Thus, as Porter and Kramer argue, the opportunity to create shared value is widespread and relevant in both mature and developing markets across many industries, reinforcing its applicability to this study.

2.3 Hypothesis Development

In this section, we draw on previous empirical research and meta-studies concerning ESG, financial performance, and stock performance to uncover the relationship between ESG and stock performance, both in developed and emerging markets. Building on the previously presented theoretical frameworks, this section serves as the basis for the hypothesis development.

2.3.1 The ESG-Stock Performance Relationship

Despite inconclusive research on the relationship between financial performance and ESG factors, much research finds a non-negative relationship between the two. This is supported by Friede, Busch and Bassen's (2015) meta-analysis, where 90% of the 2,200 primary studies under review

had a non-negative relationship between ESG factors and financial performance. The meta-analysis covered studies assessing both accounting-based and market-based studies. Similarly, in Whelan and colleagues' (2021) meta-analysis of over 1,000 research articles spanning 2015-2020, the authors found that 58% of the included studies had a positive link between ESG factors and financial performance, while 8% indicated a negative relationship, with the remaining 34% of studies reported neutral or mixed results. A positive relationship between ESG and stock performance specifically has also been found in previous research (e.g., Derwall et al. 2004; Kempf & Osthoff, 2007; Shanaev & Ghimire, 2022).

However, caution is warranted when looking at studies finding consistently positive relationships between ESG and stock returns. To begin with, the generalizability of many underlying studies are limited. This includes relying on ESG ratings from a single provider although divergences have been found across different ESG ratings (Berg et al. 2022) and some use very short sample periods which could be impacted by temporary fluctuations in investor demand (Pástor et al. 2022). Additionally, much of the research is done on developed markets, and especially, the U.S.

Moreover, several studies have found a negative relationship (Chava, 2014; Hong & Kacperczyk, 2009). A study by Renneboog et al. (2008) on SRI funds in the US, the UK, and several Asian and European countries found that SRI funds underperformed conventional benchmark portfolios. The study further found that for France, Japan, and Sweden, the performance of SRI funds was not significantly different from their benchmarks. Additionally, screening for CSR and corporate governance was found to generate lower risk-adjusted returns (Renneboog et al. 2008). Landi and Sciarelli (2019) provide similar results in a study of Italian listed companies, where they investigated the impact of ESG ratings on abnormal returns. The result of the study found a non-positive and statistically significant impact on a potential market premium (Landi & Sciarelli, 2019). Additionally, López and Kim (2022) investigated the risk-return performance of portfolios on the NYSE between 2018-2019 in relation to their ESG rating. The study revealed that ESG portfolios exhibit reduced volatility and lower returns, resulting in lower Sharpe ratios. This was found to be the case for all the individual ESG components (López & Kim, 2022). A negative

relationship between ESG and stock performance follows theoretical predictions (Fitzgibbons et al. 2021; Pástor et al. 2020).

One reason ESG is associated with lower expected returns could be ESG functioning as a hedge towards risk (McGuire et al. 1988; Pástor et al. 2020), such as legal or climate risk. This reasoning also ties back to Clark et al. (2014), who stated that risk management was one of the competitive advantages of adopting sustainability practices. Pástor et al. (2020) argue that in equilibrium, high ESG assets have lower expected returns because investors have a preference for sustainable assets but also because they hedge climate risk. Moreover, the authors add that greener firms will therefore not only have greater market value, but also attract more investments because of their lower cost of capital.

The lower expected return functions as an insurance premium on the risk (Engle et al. 2019; Lioui, 2018). This relationship is illustrated in several studies, including Zhai and colleagues (2022), who find that high ESG firms are associated with a lower inclination to systematic risk. Sciarelli and colleagues (2024) found no effect on systematic risk when they investigated the impact of a controversial firm's ESG profile and risk exposure, looking at 132 controversial companies listed on the S&P index. However, the study's findings show that the overall ESG assessment decreases idiosyncratic firm risk. In summary, companies that to a larger extent engage in ESG activities possess characteristics that seem to make their operations inherently less risky (Atz et al. 2023; Cornell, 2020; Godfrey, 2005; Luo & Balvers, 2017). Some studies have shown that, in equilibrium, investor preference towards ESG will lead to lower expected returns for companies with higher ESG characteristics (Cornell, 2020; Heinkel et al. 2001; Luo & Balvers, 2017).

Another explanation for the negative relationship between ESG and stock returns can be connected to investor preferences. Baker et al. (2018), analyse how investor preference for green bonds impacts the pricing of the security. Using an augmented CAPM-formula, the study found that the green bonds, compared to others, are sold at a premium, i.e., at a higher price but with lower returns. The authors explain that the cause of their results is most likely due to ESG-inclined

investors being willing to invest in green bonds at the expense of returns. This is in line with the reasoning of Hong and Kacperczyk's (2009) research on sin stocks, which are less ethical firms such as the tobacco, alcohol, and betting businesses. In the context of sin stocks, Hong and Kacperczyk argue that investors want to be compensated for the reputational cost of holding such stocks and, therefore, require higher expected returns.

The last common outcome of studies within the field is a neutral relationship (e.g., Hartzmark & Sussman, 2019; Managi et al. 2012; von Wallis & Klein, 2015). The neutral relationship supports that markets are informationally efficient, leading to the inability of achieving sustained superior risk-adjusted returns (Fama, 1970). In a meta-analysis of 85 studies and 190 experiments by Revelli and Viviani (2015), it was found that including CSR and ethical concerns in portfolio management generates neither a positive nor a negative effect. Similarly, Halbritter and Dorfleitner (2015) looked at the relationship between ESG ratings and returns of portfolios of U.S companies covering the period 1990-2011. They found, after applying Carhart's (1997) four-factor model, that there was no return difference between portfolios with high ESG ratings and low ESG ratings.

Moreover, Stotz explains the inconclusiveness of the ESG and stock performance relationship by separating the terms expected and realised returns. He demonstrates that while expected returns tend to show a negative relationship with high ESG scores, the opposite seems true for realised returns (Stotz, 2021). Stotz recognises this as the "ESG return puzzle" (2021). He finds that returns are mainly driven by investor behaviour as suggested by Fama and French (2007). What this means for expected returns is that as investors change their behaviour to prefer good ESG stocks, this will drive up the price, the discount rate will fall, and expected returns will relatively decline. Conversely, for realised returns, as investors increasingly invest in good companies, the realised returns for existing investors will rise as seen by the increase in stock price (Stotz, 2021).

That it is the fall in the discount rate that is lowering expected returns for high-ESG firms is supported by Cornell and Damodarn (2020). However, Cornell and Damodaran argue that contrary to many beliefs, there is weak to non-existent evidence that the market is rewarding good, high ESG firms. Instead, they underline that there is more evidence of a punitive scenario where the

bad firms are punished with higher discount rates and inhabit more risk regarding disasters and shocks rather than the opposite.

2.3.2 ESG and Stock Performance in Developed and Emerging Markets

While some argue that national differences in social and political contexts may not have as big of an impact on ESG today due to the emergence of stateless firms (Chen & Bouvain, 2009; Levi-Faur, 2005), several researchers stress that underlying legal, institutional, social, cultural and economic factors are in fact not comparable across countries (see Julian & Ofori-Dankwa, 2013). Consequently, these institutional differences are likely to impact ESG implications (Holthausen, 2009; Julian & Ofori-Dankwa, 2013). As DiMaggio (1988) proposes, organisations are sensitive to the expectations and pressures within their institutional environments. Moreover, research has illustrated how the political context within a country can affect CSR (Ioannou & Serafeim, 2012). The commitment level to sustainability and CSR across different countries varies, as does the magnitude of investors' awareness of this commitment (Takahashi & Yamada, 2021). For instance, Auer and Schuhmacher (2016) found that when comparing the U.S., Europe, and Asia-Pacific markets, geography had a strong effect on ESG and stock performance. Furthermore, emerging markets are characterised by weak institutions, as well as agency problems within firms, higher cost of external finance, and internal cost of capital (Ellahie & Kaplan, 2021; Leuz et al. 2003), all of which can impact the outcome of the ESG and stock performance relationship.

2.3.3 ESG and Stock Performance in Developed Markets - The Case of Sweden

According to Auer (2016), the approach to ESG investing in developed countries is rather sophisticated, with a strong emphasis on negative screening where companies failing to meet ESG criteria face exclusion from investment portfolios. This is particularly evident in the aversion of investors to invest in less ethical sin stocks, such as those engaged in the tobacco, alcohol, and casino industry, unless compensated with a higher return (Hong & Kacperczyk, 2009).

Europe is the region that is considered to be at the forefront in terms of ESG adaptation (Kaiser, 2020), which can be traced back to the region's sustainable finance initiatives and regulations. As a country in the EU, Sweden follows EU ESG reporting regulations. While Scandinavia has positioned itself as one of the strongest sustainability domiciles globally, Sweden is arguably one of the leading countries regarding ESG disclosure (Cahan et al. 2016). Moreover, Sweden has been reporting ESG for quite a while, with Swedish companies placing fourth in the world in integrating ESG information in their corporate reporting already a decade ago (Eccles & Serafeim, 2011). More recently, Arvidsson and Dumay (2022) found that ESG reporting quantity and quality has been growing in Sweden, but corporate ESG performance has remained at a steady rate since 2015. Furthermore, the authors illustrate how Swedish companies are comparable with the rest of Europe in regards to ESG reporting (Arvidsson & Dumay, 2022).

Summarising the aforementioned financial theories, two possible scenarios could emerge: either the lower risk associated with high ESG leads to lower returns (McGuire et al. 1988; Pástor et al. 2020), or a market preference towards high ESG could induce lower returns if the market has reached pricing equilibrium (Cornell, 2020). Although theory sometimes diverges from existing literature, it will be the main cornerstone when creating the hypotheses. We hypothesise that the relationship between ESG rating and stock performance in Sweden follows predictions from financial theory, and empirical evidence that aligns with these predictions (Chava 2014; Hong & Kacperczyk 2009). This is supported in the context of mature and sustainably inclined markets, by for example Auer and Schuhmacher (2016), who found that for the European market, there is no evidence of a positive relationship between stock performance and ESG rating, but instead for some industries and under certain ESG criterion, investors pay a premium for holding high ESG stocks. The first hypothesis is therefore as follows:

H1: Swedish portfolios with high ESG scores have lower risk-adjusted returns than Swedish portfolios with lower ESG scores.

2.3.4 ESG and Stock Performance in Emerging Markets - The Case of India

Despite the surge in sustainable investing on a global level, Singhania and Sahini (2021) conclude that companies in developing countries do not seem to be as fixated on sustainability initiatives as their counterparts in developed markets. According to a report by BCG (Azevedo et al. 2023), this observation may nonetheless not be surprising considering that the "developing" status often implies an emerging economy primarily focusing on improving Gross Domestic Product (GDP), thereby making them less inclined towards ESG initiatives. In the Asia Pacific region, ESG compliance is in its initial stage (Umar et al. 2022) it is, however, beginning to gain traction (Fabozzi et al. 2021). Nevertheless, Badía et al. (2020) found that markets in the Asia Pacific region are seemingly sceptical about whether CSR practices can yield financial benefits, reflecting a more traditional stance.

A prime example of an emerging market, that still in the early stages of the ESG discourse, is India. Being highly dominated by institutional investors (OECD, 2020), the Indian market distinguishes itself with only 23 ESG funds, a noticeable disparity compared to more developed countries such as the U.S. and UK who have around 500 respectively (Murugaboopathy & Dogra, 2021). Although emerging markets are lagging behind in ESG and CSR, the importance of ESG has been reflected in emerging markets with sustainable debt issuance threefolding from 2021 to 2022, amounting to $190 billion (Gautam et al. 2022).

In January 2023, the Indian government issued its first sovereign green bonds, signalling a commitment to sustainability (Gupta & Aggarwal, 2023). In 2009, regulatory policy on CSR reporting was introduced with voluntary guidelines, which has come to evolve over the years with an increasing number of mandates and regulatory initiatives supporting ESG reporting. In 2012, the Securities and Exchange Board of India (SEBI) introduced the Business Responsibility Report (BRR), covering ESG reporting for the top 100 listed Indian companies by market capitalisation. In 2015, this was extended to cover the top 500 listed companies, and in 2019, the BRR extended it to include the top 1,000 listed companies (Gupta & Aggarwal, 2023). However, as Gupta and Aggarwal (2023) states, based on MSCI ESG index, the total number of regulations in India on

ESG factors as of 2021 was only 4 as against 55 in the United States. Overall, the historical divergence from ESG prioritisation in emerging markets seem to be ascribed to various obstacles, including those of reporting transparency and institutional barriers (MSCI, 2020). Nonetheless, recent regulatory changes and an upswing in sustainable finance initiatives signals that a notable shift in the landscape is on the way (Goash & Paul, 2020).

Although regulatory changes and an upswing in sustainable finance initiatives signals that a notable shift in the landscape is on the way in India, there are various aspects of emerging markets that have contributed to the historical divergence from ESG prioritisation compared to developed markets. These include weaker institutions and rules governing environmental and social investments, as well as opaque corporate practices, less efficient markets and a general perception of more corruption (Kaufmann et al. 2011; Witt et al. 2016). Aspects concerning the capital market (Khanna & Palepu, 1997), the risk profiles of firms (Cheng et al. 2014) and environmental legitimacy (Ioannou and Serafeim, 2017) are all aspects have been found in literature to sets developing and emerging markets apart, and could have an effect on the ESG stock performance relationship.

Taking in consideration previous research on developing markets and the Asia-Pacific region, as well as recent ESG advancements in India, one may expect that the country has moved further along the ESG adjustment period curve. In an empirical study from the Indian market, Mohanasundaram and Kasilingam (2024) extended the Fama-French Five-Factor model adding a sustainability factor measured by Bloomberg's ESG score. The authors found that the price of ESG risk premium is positive, which means that firms with lower ESG scores yield higher returns than those with higher ESG scores, which interestingly is also in line with the reasoning of Cornell and Damodaran (2020). Approximately a third of the portfolios in the study states that there is a significant impact of ESG on returns. The insignificant relationship between the ESG factor and excess portfolio returns of the rest of the portfolios may, according to the authors, indicate that in the Indian market corporate investors have the flexibility to make decisions regarding ESG investments (Mohanasundaram and Kasilingam, 2024). Thus, the relationship between ESG rating and stock performance in India is hypothesised to be the same as Sweden:

H2: Indian portfolios with high ESG scores have lower risk-adjusted returns than Indian portfolios with low ESG scores.

Due to ESG being a newer phenomenon in India as an emerging market, compared to Sweden, the reasoning of Cornell (2020) would expect ESG to not be as integrated in the price of the stock, consequently leading to Indian companies with higher ESG scores to offer higher expected returns than their Swedish counterparts. Nevertheless, connecting to Cornell's (2020) analysis, this paper expects that a general trend should be observable in both countries where companies with higher ESG scores tend to have lower expected returns compared to those with lower ESG scores. Thus, the last hypotheses are as follows:

H3: Swedish portfolios with high ESG scores have lower risk-adjusted returns than Indian portfolios with high ESG scores.

H4: Swedish portfolios with low ESG scores have higher risk-adjusted returns than Indian portfolios with low ESG scores.

2.4 Chapter Summary

To summarise, a variety of asset pricing models have been introduced to help answer the research question on the effect of ESG ratings on expected returns. Additionally, sustainable finance theories were presented to shed light on the extent to which investor behaviour influences stock market dynamics. These theories, coupled with related empirical research on ESG and stock performance both globally and specifically in Sweden and India, led to the formulation of 4 hypotheses to be tested. The main expectations from the hypotheses are that high ESG ratings should be associated with lower expected returns. Additionally, this relationship should be stronger in Sweden than in India, meaning that high-ESG portfolios in Sweden would have lower expected returns than Indian high-ESG portfolios.

3. Methodology

In this section, the research approach and design of the study will be described. Next, the data collection process is outlined and the degree of the study's reliability and validity is analysed. Further, a description of how the ESG portfolios are created and a deep-dive into the respective data points is explained. Lastly, this section ends with a discussion of the methodology's limitations.

3.1 Research Approach

This paper has adopted a deductive approach, meaning that the hypothesis has been developed using previous research and theory (Bell et al. 2019). The current state of research on ESG and stock performance served as the basis for phrasing the research question. Furthermore, research on the disparities between developed and developing countries was used to formulate the hypotheses. Despite building on previous research, this paper contributes to existing literature by providing a more current case study and sample representing developed and developing countries in a more recent time frame.

Moreover, the paper adopts a quantitative approach, drawing on secondary data from a selection of databases to be specified in later sections (Bell et al. 2019). This choice is driven by the objective of analysing stock performance using a new data sample. Consequently, the conclusions drawn in the thesis rely on statistical tests conducted on panel data regressions of portfolios categorised by high and low ESG scores. This methodological approach has been consistently employed in previous research cited within this paper, underscoring its robustness while simultaneously facilitating comparison between findings.

3.2 Research Design

The focus of this paper is to compare portfolios of high and low ESG stocks based on the monthly expected return between the years 2015-2022. Studying the expected return is essential as it signifies the anticipated future return on an investment, shaped by a risk-return relationship

theorised to be influenced by ESG. Therefore, the aim of this paper is to analyse how such a relationship compares between a developed and developing country when introducing ESG as a variable. To accomplish this, two ESG portfolios were constructed for each country: high-ESG and low-ESG. In doing so, this thesis adopts a comparative research design, commonly used within this field of study and a prerequisite for answering the research question of this paper (e.g., Hong & Kacperczyk, 2009; Ting et al. 2020).

Central for the research design is running regressions using the Capital Asset Pricing Model, the Fama-French Three-Factor Model, the Carhart Four-Factor Model, and the Fama-French Five-Factor Model. When running the regressions, the dependent variable is always the return of the portfolio of interest (either high-ESG or low-ESG) minus the interest rate, also commonly referred to as the excess return. The independent variables vary depending on which financial model is used when running the regression. The following section will present the data collection method in more detail, including how the data was collected, how the variables were used, and how the portfolios were constructed.

3.3 Main Regression Model and Model Robustness Checks

The hypotheses in this paper are based on the main factor model which is the Fama-French 5 factor model. The reason for this is that the 5-factor model includes all of the factors in the CAPM and the 3-factor model and should therefore hold the most amount of explanatory power (Fama & French, 2015). Though the 5-factor model does not include the momentum factor as the Carhart 4-factor model does, regressions on the 4 and 3-factor models as well as the CAPM will be run. In this way, the other models will serve as robustness models that check the efficiency of the 5-factor model.

3.4 Data Collection Method

3.4.1 Sample

For Sweden, a sample of closer to 400 mid and large-capitalisation companies listed on the Nasdaq Sweden stock exchange was selected. For India, the NIFTY 500 list was used, representing the top 500 companies based on full market capitalisation and average daily turnover. Consistent to prior studies, this paper is focused on listed medium and large capitalisation companies for several reasons. To begin with, data availability is a crucial factor. Larger companies tend to present more comprehensive data available, including financial metrics and ESG scores, which is key in this paper. Secondly, opting for companies listed on the two largest national indexes provides the advantage of a larger sample size, thereby increasing the robustness of the findings and strengthening statistical inference (Bell et al. 2019). Lastly, selecting companies from the same size categories facilitates comparability between the two countries, enabling a more representative analysis on the similarities and differences on stock performance and ESG practises in Sweden and India (Bell et al. 2019). The sample is thereby not a random sample but rather a convenience sample.

3.4.2 Global Factor Data

The Fama French factors, serving as basis for the financial models used in this paper, can be extracted from various data libraries depending on the data points of interest. For this paper, the independent variables SMB, HML, RMW, CMA and MOM were downloaded from the database Global Factor Data (n.d) in order to conduct the regressions. All of these data points are created using value-weighted portfolios tailored to specific markets. The choice of using the Fama French factors from Global Factor Data for Sweden and India, rather than independently calculating the variables, is due to the high reliability of the database. The database is based on the construction in Jensen et al. (2023). The creators are credible financial modellers and considered on the forefront of their field. Additionally, the source is commonly used in the field, reinforcing its suitability for this research.

3.4.3 Bloomberg's ESG Score

This study used Bloomberg's aggregated yearly ESG score when collecting ESG data for each company in respective countries (ESG_score). The ESG score ranges from 0 to 10, in which a higher number represents higher ESG activity (Bloomberg, 2024). More specifically, the score is based on Bloomberg's view of financial materiality, which is supported by published CSR reports, proxy statements, corporate governance reports, and company websites with 120 different indicators (Bloomberg, 2018). Overall, the aggregated score is expressed as a weighted average of the individual pillar scores: Environmental, Social, and Governance. (Bloomberg, 2024). In turn, embedded in the individual pillars are various operational measures such as carbon emissions, board management, and financial transparency. The decision to utilise Bloomberg as the source for ESG scores was primarily influenced by its widespread adoption in prior research within the field (e.g., Eccles et al. 2014; Fatemi et al. 2018; Hamrouni et al. 2020), coupled with its position at the forefront of financial data bases.

3.4.4 Portfolio Construction and Screening

In order to test the hypotheses and evaluate the relationship between ESG and stock performance, two different ESG portfolios were constructed for each country: *High ESG* and *Low ESG*. Similar to other studies on portfolio construction in an ESG context, this paper employed a percentile-based approach (Diaz et al. 2021; Hollstein et al. 2023). To do this, stocks, alongside their market capitalisation, were sorted based on their ESG scores from highest to lowest. Then, percentiles at the 80th and 20th level were used in order to create a breakpoint between the two portfolios for each country, resulting in a total of four ESG portfolios. Since a company's ESG score can vary over time, there was a continuous portfolio rebalancing throughout the time period. This means that while a company might have fallen in the low ESG portfolio one period, it would have been included in the high portfolio in another time period in the event that the ESG score had been altered by Bloomberg to make it into the 80th percentile. Similarly, if the ESG ranking were to be lowered by Bloomberg, the company could be downgraded to the low ESG portfolio. By

constructing the portfolios in this manner, Hollstein et al. (2023) argue that results should achieve a higher level of robustness and accuracy since more centred breakpoints tend to result in less idiosyncratic risk.

3.4.5 Selection and Exclusion

Table 1 summarises the number of companies included in each of the following four ESG portfolios: *Sweden High ESG*, *Sweden Low ESG*, *India High ESG*, and *India Low ESG*. Since all portfolios hold more than 30 stocks, Stratman (1987) argues that the central limit theorem applies, meaning that the portfolios should be diversified enough to accurately reflect the characteristics of the country populations. However, due to unavailability of ESG-scores in the Bloomberg database and stock returns for certain stocks, these had to be excluded from the sample. In the end, a total of 20 and 35 data points were excluded from Sweden and India respectively, which is illustrated in the table below.

Table 1. Number of Stocks Included and Manually Excluded in Each Portfolio

Variable	Included	Excluded
Sweden		
High-ESG	75	19
Low-ESG	78	1
Total	153	20
India		
High-ESG	97	21
Low-ESG	84	14
Total	181	35

3.4.6 Weighting of Portfolios

There are two commonly used methods for weighing stock returns when constructing portfolios: equal-weighted and market capitalisation-weighted (Tabner, 2011). While some researchers advocate for the former (De Miguel et al. 2009), other scholars argue that a market capitalisation-weighted approach is the most efficient and accurate way of constructing a portfolio (FTSE Russel, n.d.; Plyakha et al. 2012). With reference to the latter, this paper adopted a market capitalisation-

weighted approach when constructing portfolios. Under this method, securities are weighted proportionally to their market value, resulting in larger companies being assigned a larger weight in the portfolio and vice versa (Nasdaq, n.d). Given that the majority of index funds trading on the market today are value weighted, the approach should be considered relevant (Nasdaq, n.d). This is further supported by the findings of Plyakha et al. (2012), who show that equal-weighted portfolios can show skewed results as smaller companies tend to have higher risk-premiums, creating misleading results if given a larger weight in the portfolio.

Formula for weighting of stocks:

$$Weight_{Stock\ A} = \frac{Market\ Value\ Stock\ A}{Market\ Value\ of\ the\ Portfolio}$$

Formula for monthly stock return:

$$Total\ portfolio\ return: R(P) = X_a * R_a + X_b * R_b + \ldots + X_n * R_n$$

Where:

$$R_p = Total\ return\ of\ the\ portfolio, X = Weight, R = The\ stock's\ total\ return$$

The data points for market capitalisation and stock return were downloaded to Microsoft Excel using the FactSet add-in function. The matrix algebra formula "MMULT" in Microsoft Excel was then used to calculate the weighted return for the portfolios in an efficient manner.

3.4.7 Time-Period and Frequency

The time-period for this thesis is between 2015-2022. To begin with, 2015 was chosen as the starting year as this is the first year Bloomberg reported ESG scoring data. Secondly, 2022 represents the last observed year since it is the last year that ESG data can be retrieved from Bloomberg. In this way, this paper has captured ESG since its inception up until its most recent

data point. This signifies the broad perspective that this paper aims to take on analysing ESG in its entirety and contributing to research with the most up to date data for both countries. Also worth mentioning is that data was collected on a monthly basis in order to create portfolios compatible with the frequencies of the independent variables of Fama French. The rationale behind opting for monthly data rather than daily or yearly stemmed from the need to strike a balance between accuracy and granularity. While higher frequencies can be subject to short-term fluctuations, yearly returns may lack the data points necessary to capture short-term trends. Hence, this paper provides a more stable time series, allowing for identification of trends while ideally also reducing volatility inherent in daily data. Moreover, it allows for a sample of 96 observations for the time period (12x8), setting a great contrast to a scenario of yearly data collection (1x8).

3.4.8 Data Collection Process

The tool for gathering ESG data was the financial data service Bloomberg through its add-in function in Excel. Bloomberg was chosen both for its reliability as the best-in-class financial data provider worldwide but also since it provides ESG data scores of high quality and credibility. Data was downloaded into excel using the Bloomberg BQL function, an API tool that effectively downloads datasets and Bloomberg excel formulas. The ESG data was downloaded on an annual basis since this is the frequency in which Bloomberg reports ESG scores. The first data point that was collected was the ESG score for each company using the BQL tool in Microsoft Excel:

+ESG_score(dates=range("start date of the period","end date of the period", frq=Y),per=Y)

The data on stock returns and market capitalisation was collected from FactSet via the add-in function in Excel. FactSet was selected for its high reliability in data gathering (Corporate Finance Institute, 2024; Phillips, 2016), positioning itself as another leading financial database for data retrieval. The first data point collected from FactSet was each stock's compounded monthly return. Compounded return was chosen since it adjusts for dividends, which is crucial for making portfolios comparable (Factset Research Systems, n.d.). The data was extracted from FactSet through the following formula:

+FDS("Company Ticker","P_TOTAL_RETURNC("start date of the period","end date of the period",AM,local currency)")

The second data point collected from factset was the market value of each company, also referred to as market capitalisation. These data points are essential in order to successfully weigh the securities in accordance with the market capitalisation-weighted approach as discussed in earlier sections. The market capitalisation was based on the last trading day for the period of interest in order to ensure alignment with Bloomberg's disclosure of ESG scores. The market value was retrieved through the following formula:

+FDS("Company Ticker","FREF_MARKET_VALUE_COMPANY("last day of the period of interest",,local currency,,0""LEGACY"")")

3.5 Validity and Reliability

3.5.1 Validity

Validity concerns whether the research has measured what it was set out to measure (Bell et al. 2019). Given that ESG is a relatively new phenomenon, construct validity was a primary concern of this paper. As literature has yet to reach consensus on what exactly constitutes a "good company", a diverse range of metrics can be used to evaluate ESG (Cornell & Damodaran, 2020). This entails that the ESG metric used will define and provide bias from the start in determining what a "good" company is. Moreover, concerning internal validity, the methodology of the paper uses well-renowned factor models that are highly regarded within the field that analyse alpha in ESG contexts (Hong & Kacperczyk, 2009). Additionally, it is common to compare the alphas between ESG portfolios (Pastor et al. 2020). However, theoretically, it may be challenging to fully isolate the portion of alpha that is solely attributed to the effect of ESG. Naturally, there can be other variables holding explanatory power for the fluctuations in stock performance. However,

using panel data provides advantages concerning such internal validity since the subjects are examined cross-sectionally and over time (Bell et al. 2019). In this way, the dependent variable is more isolated and a cause-and-effect relationship between the variables can more easily be drawn, thus providing support to the internal validity of this study.

External validity refers to the extent that the results from the study can be generalised above the conditions of the study (Bell et al. 2019). Since this paper only examines Sweden and India to represent developed and emerging markets, it can be problematic to generalise the results to the entire market. Additionally, the authors do not recommend that the results are generalised to another time-period that the ones observed. This is particularly important given the novelty of ESG (Cornell, 2020). Despite these statements, external validity for the population of companies in the countries analysed can be considered high due to the large sampling of 500 companies.

3.5.2 Reliability

Reliability, on the other hand, refers to a measure's consistency, meaning that the study can be replicated and still produce the same results (Bell et al. 2019). Since this paper does not conduct any primary observations and the methodology is built on secondary sources, reliability should be high. The databases with the stock data, ESG Bloomberg scores, and the factors from Global Data are all data points that should not change over time and are highly accessible. Given this, there should be little bias and high transparency in the data collection process. Moreover, the data was retrieved and aggregated using the Bloomberg Terminal, FactSet, and Microsoft Excel, three reputable and customary tools in financial data gathering and analysis (WallStreetPrep, n.d.). In addition, this paper explicitly explains all the steps and formulas used throughout the data collection process. Hence, if replicated, one should be able to generate the same results and reliability is therefore deemed to be high.

3.6 Data Analysis

3.6.1 Dependent and Independent Variable

In this paper, we define the dependent variable as the excess return of each portfolio of stocks. This is done by subtracting the risk-free rate from the return of each portfolio ($r_i - rf$). The independent variables, on the other hand, vary depending on which financial model is applied. To reiterate, the Fama French Five-Factor model incorporates the vast majority of the variables that will be tested and is expressed as follows:

Five-factor formula: $ri = rf + ai + \beta(rm - rf) + \beta sSMB + \beta vHML + \beta rRMW + \beta cCMA$

It is important to highlight that these independent variables serve as control variables given, they all hold a certain explanatory power of expected returns. More specifically, the factors help account for known sources of risk and variations in stock returns, enabling a more accurate analysis of the effects of ESG on stock performance. Firstly, ($r_m - rf$) represents the return of the market minus the risk-free rate, meaning the specific risk attributed to the market. Secondly, is the variable SMB which accounts for the expected returns depending on the size of the company. Next, HML explains the returns depending on whether the company is highly or lowly valued. These three variables ($r_m - rf$, SMB, and HML) denote the three-factor model, which was later extended by the five-factor model to also include RMW and CMA. The former abbreviation refers to the difference between high operating and low operating companies, whereas the latter quantifies the difference in expected return between companies with low degree of investments to those with high degree.

In contrast to the Fama French five-factor model, the Carhart four-factor model does not include RMW and CMA, but rather extends the three-factor model by incorporating momentum (MoM) as a fourth factor. The momentum factor aims to explain how companies with recent high stock performance compared to those with recent low performance affects expected returns.

3.6.2 Risk-Free Rate

The risk-free rate is the rate of return that an investor would receive upon investing in a risk-free asset. In other words, it should represent the lowest return an investor can expect from a security without taking on additional risk (Binsbergen, et. al. 2021). Within the field of finance, it is common practice to use the national government treasury bill as proxy for the risk-free rate, owing to its low probability of default (Fama & French, 2015). In practice, however, an investment is unlikely to have 0% probability of default. Nevertheless, it is still used as a theoretical rate of return for a risk-free investment (Hayes, 2022). The returns above a certain benchmark, such as the risk-free rate, is noted as the risk-premium, indicating a higher required rate of return due to taking on more risk (Binsbergen et al. 2021). For the above mentioned reasons, the one-month Swedish and Indian treasury bills were used in the calculations as the risk-free rate.

3.6.3 Intercept

Jensen's alpha is in this study used as the intercept of the regression. This is denoted as a_i in all of the factor models. Alpha represents the return above the risk-free rate on the portfolio that is not explained by any of the independent variables i.e the factors in the models (Jensen, 1968). The alpha is the main coefficient of analysis in the study as it will both indicate the significance of the model as well as the direction and its magnitude. Upon conducting the regressions, the formula will be restructured so that the single standing rf is subtracted to the left side of the equation. This is done in order to ensure alpha as the sole intercept variable upon running the regressions, while simultaneously making outputs of the regressions more intuitive and comparable.

3.6.4 The Coefficient of Multiple Determination

The coefficient of multiple determination is a statistical measure in a regression model that describes the proportion of variance in the dependent variable that can be explained by the independent variables (Berenson et al. 2020). Given that this research is running a time-series regression, the coefficient of multiple determination is denoted by r^2. The R-square in the

regressions for the factor model therefore states how much excess return, if any, that is explained by the factors in the model.

3.6.5 Statistical Tests

To determine which regression model to be applied, assumption testing was conducted in STATA to analyse the regression models' requirements. The three models were pooled OLS, fixed effects and random effects. This was done by assessing the assumption of multiple linear regression, a Hausman, and a Breusch and Pagan test. The results from the tests indicated that a pooled OLS would be best suited. Moreover, the assumptions of the pooled OLS were tested which were linearity, independence, heteroscedasticity, and the normality of errors. To test these assumptions, linear and residual scatter plots were created. Moreover, a White's test, a Kernel-Density estimate, and a VIF analysis was performed. The main assumptions for a pooled OLS were met, implying that there was no autocorrelation or multicollinearity. However, given some evidence of heteroskedasticity, a robust pooled OLS regression was suggested. The results of the statistical tests will be explained in more detail in the results section.

3.6.6 Panel Data Regressions and POLS

This paper is running 4x2x2 regressions which means sixteen regressions in total, eight for each country. An Ordinary Least Squares (OLS) regression will be adopted since it is a multiple linear regression technique that creates a linear regression to explain the relationship between multiple independent variables. This is because the equations in the factor models mathematically express a linear relationship. The least-squares method determines the values of the coefficients (betas) that minimise the sum of squared difference around the predictive linear line (Berenson, et. al. 2020). Four regressions are run for each portfolio using the statistical software package STATA. Similar to the standard OLS, a pooled OLS has been adopted to the panel data framework to estimate the factor models and has been used by scholars such as Racicot et al. (2018). Pooled OLS is commonly used for panel data since it estimates the multiple linear regression while accounting for both cross-sectional and time-series valuations in the dataset (Woolridge, 2010).

3.7 Method Summary

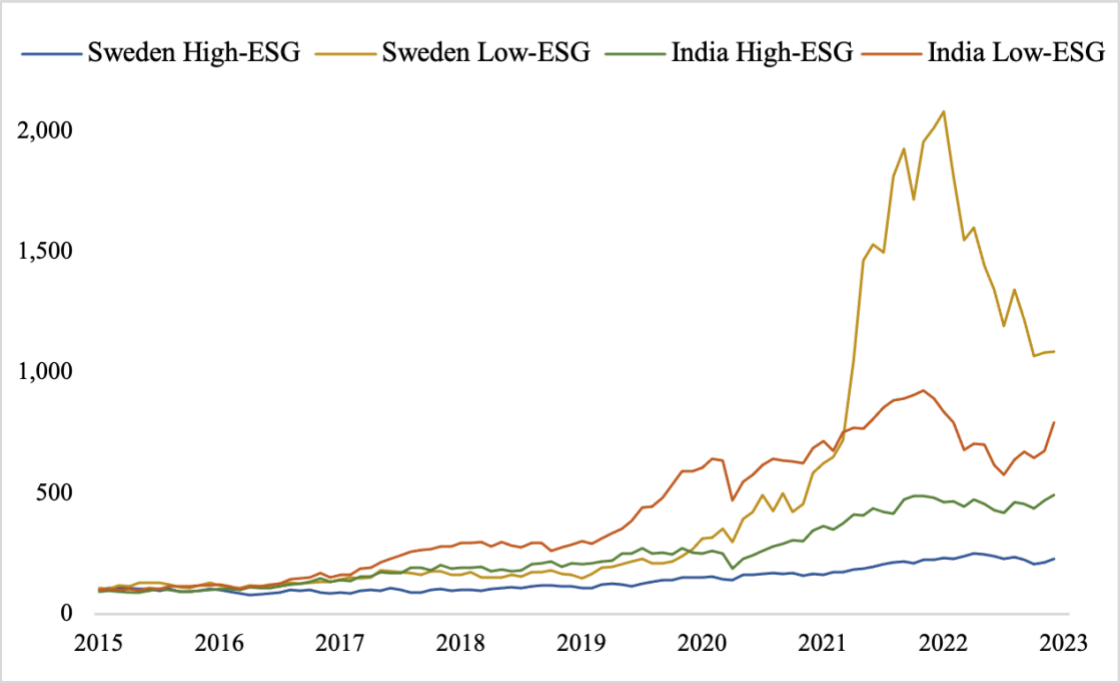
Summarising the methodology section, a quantitative study was adopted by using panel data in order to incorporate both the cross-sectional as well as the time-series dimensions. Data from FactSet and Bloomberg was used in order to build the high- and low-ESG portfolios, while data points from Global Factor Data was retrieved to create the dependent and independent variables for the multifactor regressions. The dataset was created in Microsoft Excel and the regressions and the statistical tests were run in STATA.

4. Results

In this section, the results from the methodology section and the regressions will be presented. First, descriptive statistics of the data will be presented. Next, the regression results for the high-ESG and low-ESG portfolios will be analysed for Sweden and India respectively. Finally, the section ends with a summary of the outcomes of the hypotheses.

4.1 Descriptive Statistics

Figure 1. Total Portfolio Excess Returns. Rebased to 100.



The line chart above demonstrates the total excess returns for Sweden and India's high-ESG and low-ESG portfolios between 2015-2022. The portfolio excess returns are rebased to 100 and adjusted for the risk-free rate in order to ensure comparability and more accurately capture the fluctuations in different ESG portfolios over time. The graph illustrates how low-ESG portfolios have outperformed the high-ESG portfolios in Sweden and India. Performing best was the Swedish low-ESG portfolio, which yielded a total return of 988%, implying a compounded annual growth rate of 41%. The second-best portfolio was India's low-ESG portfolio, yielding a total excess return of 695% and a compounded annual growth rate of 34%. Consequently, the two high-ESG portfolios ended up as the least-performing portfolios. In third place, the Indian high-ESG portfolio yielded a total return of 392% over the years, and a compounded annual growth rate of 26%. Finally, the Swedish high-ESG portfolio yielded a 128% return with an annual compounded growth rate of 13%.

Summarising the development of the four portfolios, returns for high-ESG portfolios appear to grow at a stable but moderate rate in both countries over time. For Sweden, the two portfolios grew at a quite similar rate up until 2021 in which the low-ESG portfolio saw an extraordinarily high spike. A few underlying reasons may explain why the portfolio performed abnormally well in 2021. To begin with, this paper adopts a market capitalisation-weighted approach, meaning that companies with higher market value influence portfolio returns to a larger extent. This is relevant as there were a couple of companies that stood out in 2021, both when it comes to market capitalisation and stock performance. Some of these include Vestum, Cint, and Instalo, who all positively influenced the portfolio with their individually strong stock performances and comparatively high market values in 2021.

Table 2. Descriptive Statistics of Portfolio Returns

Variable	Sweden High-ESG	Sweden Low-ESG	India High-ESG	India Low-ESG
Total Return	128%	988%	392%	695%
Mean	1.01%	3.1%	1.91%	2.43%
Maximum	16.07%	46.3%	21.60%	17.75%
Minimum	-10.57%	-16.2%	-25.10%	-25.98%
Standard Deviation	0.054	0.107	0.064	0.066
Obs	96	96	96	96

Given that the models of this paper are based on fundamental risk-return assumptions, the portfolio returns cannot be viewed in isolation. Hence, table 2 depicts some additional descriptive statistics of the portfolios. As previously discussed, the element of risk plays an important role for the expected return of an asset as the more volatile the security, the higher the expected return (Hong & Kacperczyk, 2009). This risk-return relationship is also found when looking at the individual standard deviations of the four portfolios. While the Swedish low-ESG portfolio yielded the highest returns over time, it also experienced the highest levels of volatility (0.107) among all portfolios. In contrast, the Swedish high-ESG portfolio demonstrated the lowest levels of volatility of only 0.054, while simultaneously yielding lowest returns out of the four portfolios. The same relationship was found in India where the low-ESG portfolio yielded higher returns than the high-

ESG portfolio, but at the expense of risk. At last, the number of observations totalled 96 given that these were the number of monthly portfolios between 2015 and 2022.

This risk-return relationship is further exemplified when comparing the min and max values of the four portfolios. As evidenced in the table, there generally seems to be a greater spread between minimum and maximum excess returns for low-ESG portfolios compared to high-ESG portfolios, aligning well with differences in portfolio volatility. However, an interesting observation is that the minimum excess returns are quite similar for Sweden and India. What this suggests is that, considering the risk-return retaliation, although you can achieve higher excess returns by investing in the low-ESG portfolio, the additional risk that you have to take on in India is not as high as in Sweden. This is further evidenced by the fact that there is a clear divergence between the volatility in the Swedish ESG portfolios, where in order to achieve greater returns, you also need to take on more risk. In contrast, the Indian high-and low-ESG portfolios fall quite closely with standard deviations of 0.064 and 0.066 respectively, despite the low-ESG portfolio yielding significantly higher excess returns. What this suggests is that the risk-return relationship appears to be much less pronounced in India. However, why this could be the case will be discussed in chapter 5.

In order to analyse the significance of the means between the portfolios, a t-test is often used. However, before doing a t-test, the Barlett test was run to test the variability in variances, which showed to be unequal for both countries. For this reason, a t-test with unequal variances was conducted in STATA to analyse the difference between the sample means. For Sweden, the t-test was 6.1 and for India, the t-test statistic was 5.6, indicating a significant difference for the means between high-ESG and low-ESG portfolios. The direction of the means signifies that low-ESG portfolios have higher means than high-ESG portfolios. An important thing to note, however, is that the t-test assumes independence, meaning that each sample is not influenced or related to the values in the other samples. Unfortunately, this is not entirely the case for the data since each individual company could appear multiple times in the different samples given the constant rebalancing of portfolios. Though this study apologises for this violation, Cohen's d measure is further added to support the t-test. Cohen's d is used to measure the magnitude of difference

between the ESG portfolios in each country and is an additional method to assess the significance of the findings. The results show a 0.9 value for Sweden and a 0.8 value effect for India. This indicates a large effect size and a substantial difference between the means which entails that there is a noticeable and meaningful difference between high-ESG and low-ESG scores for the two countries.

4.2 Regression Results

4.2.1 Sweden Results High-ESG Portfolios

Table 3. Regression Results for the Swedish High-ESG Portfolio

	CAPM	3-factor	4-factor	5-factor
a	1.393***	1.407***	1.408***	1.397***
Standard error	*(0.052)*	*(0.052)*	*(0.052)*	*(0.048)*
Rm-Rf β	-1.127	-0.683	-0.753	-2.661**
Standard error	*(1.191)*	*(1.001)*	*(1.005)*	*(1.175)*
SMB β		-5.122*	-5.159*	-2.524
Standard error		*(2.951)*	*(2.969)*	*(4.573)*
HML β		1.951	1.694	8.685***
Standard error		*(2.336)*	*(2.807)*	*(3.155)*
MOM β			-0.453	
Standard error			*(2.670)*	
RMW β				8.820
Standard error				*(5.360)*
CMA β				-11.770**
Standard error				*(4.939)*
Observations	96	96	96	96
R-squared	0.013	0.061	0.061	0.181
Standard errors	Robust	Robust	Robust	Robust
Method	POLS	POLS	POLS	POLS

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 3 shows the regression results for the high-ESG portfolio in Sweden. The alpha is shown to be significant for all models at the one percent significance level. The R-square ranges from 1.3%

for the CAPM to 18.1% in the 5-factor model, indicating that for each additional factor that is introduced, the model's explanatory power becomes higher. Investigating the models more specifically, CAPM alone does not show any significance. The Fama-French 3-factor and 4-factor models however, shows that SMB is statistically significant at the 10% level. Lastly, the 5-factor model has three explanatory factors where HML is significant at the 1% level and the risk-free rate and CMA are significant at the 5% level.

4.2.2 Sweden Results Low-ESG Portfolios

Table 4. Regression Results for the Swedish Low-ESG Portfolio

	CAPM	3-factor	4-factor	5-factor
a	5.024***	5.210***	5.223***	5.024***
Standard error	*(0.586)*	*(0.589)*	*(0.597)*	*(0.539)*
Rm-Rf *β*	-14.484	-6.258	-7.405	-28.356**
Standard error	*(13.217)*	*(10.110)*	*(11.559)*	*(11.179)*
SMB *β*		-60.486*	-61.086*	-7.666
Standard error		*(33.498)*	*(33.250)*	*(55.085)*
HML *β*		41.228	37.040	103.525***
Standard error		*(29.373)*	*(29.500)*	*(35.444)*
MOM *β*			-7.369	
Standard error			*(32.188)*	
RMW *β*				134.736**
Standard error				*(64.881)*
CMA *β*				-103.860*
Standard error				*(53.129)*
Observations	96	96	96	96
R-squared	0.016	0.096	0.097	0.216
Adj. R-squared				
Standard errors	Robust	Robust	Robust	Robust
Method	POLS	POLS	POLS	POLS

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 4 shows the regression results for the low-ESG portfolio in Sweden. The alpha too is significant for all models at the one percent significance level. The R-square ranges from 1.6% to 21.6%, once again showing how the explanatory power of the models increases when introducing

more factors. In addition, the fact that the 5-factor model shows the highest R-square supports the decision to use the model as the main one. Furthermore, the SMB factor shows significance at the 10% confidence level for the 3- and 4-factor models. In the 5-factor model, HML has significance at the 1% level, Rm-rf and RMW at the 5% level, and lastly CMA at the 10% level. While the results from the models are similar to those of the Swedish high-ESG portfolio in terms of factor significance, a notable distinction is that the RMW factor is significant for the low-ESG portfolio but not for the high-ESG portfolio.

4.2.3 India Results High-ESG Portfolios

Table 5. Regression Results for the Indian High-ESG Portfolio

	CAPM	3-factor	4-factor	5-factor
α	2.477***	2.459***	2.423***	2.452***
Standard error	*(0.136)*	*(0.132)*	*(0.138)*	*(0.138)*
Rm-Rf *β*	-1.192	-1.972	-1.645	-1.583
Standard error	*(2.196)*	*(2.454)*	*(2.525)*	*(2.999)*
SMB *β*		10.699*	10.858*	14.268
Standard error		*(6.239)*	*(6.302)*	*(9.344)*
HML *β*		0.115	2.357	3.017
Standard error		*(7.956)*	*(8.653)*	*(9.571)*
MOM *β*			4.874	
Standard error			*(5.113)*	
RMW *β*				5.507
Standard error				*(10.946)*
CMA *β*				-5.193
Standard error				*(11.000)*
Observations	96	96	96	96
R-squared	0.003	0.044	0.051	0.050
Standard errors	Robust	Robust	Robust	Robust
Method	POLS	POLS	POLS	POLS

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 5 shows the regression results for the high-ESG portfolio in India, in which the alpha is significant at the 1% level for all models. The R-square ranges from 0.3% to 5.1% indicating that

the factor models have a low explanatory power in predicting expected returns. In contrast to the Swedish regression results, the Carhart's 4-factor model holds the highest explanatory power for excess returns. However, the difference in R-square between the 4-factor and the 5-factor model is rather insignificant with a difference of 0.001. Overall, the results indicate no significant factors for the CAPM and the 5-factor models. However, the SMB shows significance at the 10% level for both the 3- and 4-factor models.

4.2.4 India Results Low-ESG Portfolios

Table 6. Regression Results for the Indian Low-ESG Portfolio

	CAPM	3-factor	4-factor	5-factor
α	4.146***	4.100***	4.061***	4.082***
Standard error	*(0.273)*	*(0.268)*	*(0.281)*	*(0.278)*
Rm-Rf *β*	-1.619	-2.570	-2.207	-1.412
Standard error	*(4.368)*	*(4.864)*	*(4.937)*	*(5.581)*
SMB *β*		25.172**	25.349**	37.531**
Standard error		*(12.111)*	*(12.266)*	*(18.633)*
HML *β*		-8.643	-6.155	3.046
Standard error		*(15.706)*	*(17.178)*	*(18.675)*
MOM *β*			5.410	
Standard error			*(11.424)*	
RMW *β*				18.694
Standard error				*(22.196)*
CMA *β*				-22.629
Standard error				*(24.833)*
Observations	96	96	96	96
R-squared	0.001	0.045	0.047	0.066
Standard errors	Robust	Robust	Robust	Robust
Method	POLS	POLS	POLS	POLS

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 6 shows the regression results for the high-ESG portfolios in India. The alpha is significant at the 1% level for all models. The R-square ranges from 0.1% to 6.6%, which similarly to the regression results for the high-ESG portfolio suggests low predictive power of the model.

Moreover, the 5-factor model for India shows the highest R-square. Looking at the factors, only SMB is significant for the 3-, 4- and 5-factor models at the 5% level. However, given the high negative correlation between SMB and RMW in the 5-factor model (see Figure 2 in Appendix) one should interpret these coefficients with caution.

4.2.5 Regression Diagnostics

In order to choose which panel regression model to run, statistical tests were performed for both countries. First, Hausman tests were conducted. The results showed that the null hypothesis could not be rejected, indicating that a random effects regression should be preferred over the fixed effects. Next, Breusch and Pagan tests were conducted to test between the random effects model and the pooled OLS. The results showed that there was no significant unobserved heterogeneity, meaning that a pooled OLS is appropriate. Moreover, a robust pooled OLS was implemented to adjust for potential serial correlation or heteroscedasticity of errors (Woolridge, 2010). The results from the assumptions testing of the pooled OLS are presented below, along with reasoning as to why a robust standard error is chosen.

Linearity

For the assumption of linearity, two-way scatter plots were run for all the factor variables. For India, there was no indication of linearity for any of the factors (see Figure 3 in Appendix). For Sweden, there is little indication of linearity though Rm-Rf has a very slight positive relationship which is deemed not to vastly impact the validity of the model (see Figure 4 in Appendix).

Independence and Autocorrelation

To test independence and autocorrelation, scatter plots of the residuals were constructed for each regression. If the residuals were to show serial correlation, this would mean that the assumption of independence was violated. The plots for each regression show no strong systematic pattern and the residuals, for both countries, are mainly clustered around zero which indicate accurate model predictions (see Figure 5 and 6 in Appendix). However, for all regressions, there is a slight increase

in the spread of residuals for higher fitted values, which shows that the variance of the residuals is not constant, which could indicate that there is heteroscedasticity.

Heteroscedasticity

Heteroscedasticity refers to the fact that the data should not have different error variances. To test heteroskedasticity, skewness, and kurtosis, a White's test as well as the Cameron and Trivedi's decomposition of the IM-test was run on the datasets. The results reject the null-hypothesis, which indicates that there is evidence of heteroskedasticity. Thus, a robust POLS regression is run, meaning that it includes robust standard errors that account for heteroscedasticity.

Normality of Errors

To assess the normality of errors, a Kernel Density estimate was conducted. For Sweden, the residual plot shows a slight skew to the right of the normal distribution plot and a sharper peak around the mean (see Figure 7 in Appendix). In such cases, robust regressions are recommended which, as mentioned, this thesis has applied. For India, the Kernel Density follows the normal distribution curve well, meaning that there is little indication for the normality of errors assumption to be violated (see Figure 8 in Appendix).

Multicollinearity

To test multicollinearity, a Variance Inflation Factor (VIF) analysis and a matrix correlation table was created. For the VIF, all factors for Sweden and India had VIF values below 4 meaning that there is little concern for multicollinearity (see Figure 9 in Appendix). When looking at the correlation matrix table (see Figure 2 in Appendix), all variables except for one, show values below 0.6 which indicates low correlation according to Johannessen, Tufte and Christoffersen (2004) who state that 0.7 is the threshold for when high correlation is met. The only concern, therefore, would be the high negative correlation between the SMB and RMW factors in India. This is nevertheless not surprising given that conditions that benefit smaller firms do not always align with those driving robust profitability, thereby creating an inverse relationship between the two, as evidenced in prior research (Aryani et al. 2019; Ali et al. 2022).

4.3 Outcome of Hypotheses

- *H1: Swedish portfolios with high ESG scores have lower risk-adjusted returns than Swedish portfolios with lower ESG scores.*

The null-hypothesis is rejected since it is significant at the one percent level.

- *H2: Indian portfolios with high ESG scores have lower risk-adjusted returns than Indian portfolios with low ESG scores.*

The null-hypothesis is rejected since it is significant at the one percent level.

- *H3: Swedish portfolios with high ESG scores have lower risk-adjusted returns than Indian portfolios with high ESG scores.*

The null-hypothesis is rejected since it is significant at the one percent level.

- *H4: Swedish portfolios with low ESG scores have higher risk-adjusted returns than Indian portfolios with low ESG scores.*

The null-hypothesis is rejected since it is significant at the one percent level.

4.4 Chapter Summary

This chapter outlined the descriptive statistics followed by the results from 16 regressions from the four ESG portfolios and four financial models. All null-hypotheses were rejected, suggesting the following outcomes: 1) low-ESG portfolios outperform high-ESG portfolios 2) Swedish low-ESG portfolios outperform Indian low-ESG portfolios, and 3) Swedish high-ESG portfolios underperform Indian high-ESG portfolios.

5. Analysis and Discussion

This section will analyse the results from the previous section in light of theory and other research within the field. The applicability of financial and sustainable finance theory, as well as a comparison to previous empirical research, will be discussed with the aim of bringing further insights to the complex debate regarding the relationship between ESG and stock returns. Moreover, the section will cover implications for research as well as practical implications. Finally, limitations of the study and its generalizability will be discussed, including potential directions for future research.

5.1 Revisiting the Research Aim

After conducting an extensive review of previous research and empirical studies on the relationship between ESG rating and stock performance, the inconclusiveness regarding the relationship was evident. Furthermore, a notable gap was identified concerning the scarcity of studies focusing on emerging markets. Moreover, few studies had included Bloomberg's most up-to-date ESG ratings. With this in mind, this study set out to investigate the relationship between corporate ESG ratings and stock performance during the time period 2015-2022 in both Sweden and India. These countries were chosen to serve as case studies to represent a developed and an emerging market, and the time period was chosen to include Bloomberg's ESG score from all available years. It is important to reiterate that the two countries are not exhaustive or fully representative of their respective market categories. Rather, the findings from the individual countries serve as examples contributing to a broader analysis within a wider context.

With the aim of exploring how ESG portfolios in two inherently dissimilar countries with different degrees of ESG implementation would affect expected return, appropriate methodology employed. The objective was to analyse the monthly excess returns of high and low ESG-rated portfolios of companies in Sweden and India. Grounded in financial theory and previous research, the Fama-French 5-factor model served as the main model for the study. Specifically, a pooled OLS regression was used for the statistical analysis of the panel data. By complementing the 5-factor

model with the well-known CAPM and 3 and 4-factor models, the robustness of the main model was further supported.

With this in mind, the results of the study contribute meaningfully to the aims and objectives initially set out. The research question is addressed through the hypotheses, all showing significant results, thereby supporting the existence and direction of a relationship. The study adds to existing literature by addressing the research gap on developed countries, serving as an important contribution to a highly inconclusive field. Furthermore, the cases help conduct a comparative analysis by giving context to the differences and similarities between a developed and an emerging market. Nevertheless, while the study offers valuable additions to existing literature on the dynamics of ESG and stock performance in Sweden and India, the results do not offer definite conclusions that pertain to all circumstances. Given the conflicting results from previous empirical research, further investigation is warranted to gain deeper insights into this complex relationship.

5.2 Analysis of Results

5.2.1 Hypothesis 1 & 2

- *H1: Swedish portfolios with high ESG scores have lower risk-adjusted returns than Swedish portfolios with lower ESG scores.*

- *H2: Indian portfolios with high ESG scores have lower risk-adjusted returns than Indian portfolios with low ESG scores.*

Given the inconclusiveness of empirical research, Hypothesis 1 and 2 were primarily based on financial theory of the risk-return relationship on the stock market. The regression outputs were significant for both Sweden and India, suggesting that low-ESG portfolios are likely to provide higher risk-adjusted returns than high-ESG portfolios, as hypothesised. Not only does this hold

true for the main 5-factor model, but also for the other contributing models, thereby strengthening the robustness of the main model.

The finding of this paper that high-ESG portfolios correlates to relatively lower returns is consistent with several empirical studies finding a negative relationship between ESG and stock returns (e.g. Landi & Sciarelli, 2019; Renneboog et al. 2008). However, while the outcome aligns with much financial theory, it also contradicts the extensive body of empirical research supporting a positive or neutral relationship. In a way, the findings of this study may appear surprising, especially in light of wide-spanning meta analyses such as Friede, Busch and Bassen (2015) which revealed that 90% of the 2,200 primary studies under review demonstrated a non-negative relationship between ESG factors and financial performance.

A possible explanation to the divergences in the findings could be due to variations in the ESG rating provider utilised and the sample periods examined. Furthermore, the predominant focus of the U.S. stock market in previous literature limits the generalisability of previous research. Moreover, the difference in outcomes could be attributed to previous research pooling together results from expected returns and realised returns. Exemplified in Stotz's (2021) "ESG return puzzle", differences in the type of returns observed can namely lead to conflicting outcomes. While expected returns have been found to have a negative relationship with high ESG scores, the opposite seems to be true for realised returns.

Although realised returns were not tested in this paper, the results on expected returns still align with Stotz's (2021) predictions. The observation that high-ESG portfolios showcase lower excess returns compared to their counterparts may ascribe to a scenario in which the high demand for ESG companies has granted them a valuation premium, driving the stock prices up and thereby also lowering expected returns (Cornell, 2020). This finding aligns with Porter and Kramer's (2006) CSV theory, wherein the value of companies with a strong ESG profile will increase as their discount rates become lower. Similarly, Pástor et al. (2020) conclude that due to their lower cost of capital, greener firms will also attract more investments. In essence, our findings seem to

suggest that not only can ESG considerations benefit firms with lower cost of capital, but also the broader society by inducing more real investments by green firms.

Interestingly, the findings of this paper appear to address a common misconception among ESG advocates, namely that the corporate and social benefits of ESG equates to higher returns for investors. On the contrary, we find green investments to be inconsistent with the expectation of higher returns, signified by the notably higher alpha achieved for the low-ESG portfolios. Additionally, since green portfolios exhibit lower volatility, the findings suggest that ESG investing should be a way for investors to hedge against climate risk, rather than as a means to achieve higher returns (Pástor et al. 2020). Another interesting point to make is that since low-ESG portfolios are perceived as riskier, they may, on the contrary to green companies, command a higher risk premium. Consequently, this should elevate investors' expected returns, which is also reflected in the outcomes of this paper (Hong & Kacperczyk, 2009).

Returning to Cornell's framework on adjustment periods in the pricing of ESG assets, the fact that high-ESG portfolios generate lower expected returns in both Sweden and India suggests that market prices should have met the equilibrium threshold in both countries (Cornell, 2020). Initially, one might have expected India, as an emerging market, to not have met the equilibrium threshold given that the market is less advanced in terms of ESG compared to Sweden. However, current research (e.g., Mohanasundaram & Kasilingam, 2024) in combination with the country's recent advancement in ESG integration led the authors to hypothesise that the relationship would be the same as in Sweden. While this was confirmed, the strength of the directional relationship between the two countries differed.

5.2.2 Hypothesis 3 & 4

- *H3: Swedish portfolios with high ESG scores have lower risk-adjusted returns than Indian portfolios with high ESG scores.*

- *H4: Swedish portfolios with low ESG scores have higher risk-adjusted returns than Indian portfolios with low ESG scores.*

Hypothesis 3 proposed that Swedish high-ESG portfolios would yield lower returns than Indian high-ESG portfolios. The opposite relationship was expected for low-ESG portfolios as depicted in Hypothesis 4. These hypotheses were grounded in literature on the country-specific differences in ESG considerations as well as drawing from studies on developed and emerging markets. This literature was then applied to Cornell's (2020) adjustment period theory to develop the contrasting assumptions between the two countries.

When comparing the results of the high- and low-ESG portfolios in Sweden and India, several noteworthy findings emerge. To reiterate the statistical outcomes, Swedish low-ESG portfolios outperformed Indian low-ESG portfolios, whereas Indian high-ESG portfolios outperformed Swedish high-ESG portfolios. This discrepancy in performance between the two countries can be examined from multiple angels. Specifically, the more pronounced directional relationship on ESG and stock performance observed in Sweden, as indicated by more diverging alphas, could be viewed through Fama and French's (2007) investor disagreement framework. Since ESG preferences move asset prices, the effect of the ESG valuation premium on expected returns should be closely tied to the average attitude towards ESG in a particular market. Given this, the findings of our paper suggests that Swedish investors have a higher preference towards ESG investments than Indian investors. Notably, this contradicts the belief that today's national differences may no longer be substantial enough to have a significant impact on the relationship between ESG and stock performance (Chen & Bouvain, 2009; Levi-Faur, 2005).

Given that the models of this paper are based on fundamental risk-return assumptions, the excess returns should not be viewed in isolation. One notable finding is that the difference in standard deviation between the Swedish high- and low-ESG portfolios is larger than the difference between the Indian portfolios. While the standard deviations for the Swedish portfolios is 0.054 and 0.107 respectively, the corresponding values are 0.064 and 0.066 for India. Evidently, the difference is significantly smaller in India, suggesting that the additional risk you have to take on when investing

in companies with lower ESG profiles do not seem to be as high. In contrast to Sweden, this finding challenges the notion that investors associate low-ESG investments with higher risk, unless investors of the Indian stock market do in fact find the risks of high- and low-ESG investments to be of similar effect. With this in mind, it is important to recognize that there might be multiple reasons spanning beyond the scope of this paper as to why there is a difference between Sweden and India. Naturally, differences in institutional and regulatory frameworks, the degree of cultural awareness, as well as preferences towards ESG all influence the risk-return dynamics.

5.3 Contribution and Implications for Research

This study contributes to the existing body of literature by adding insights into the debated dynamics of the relationship between ESG and stock performance. The results support previous research indicating a negative relationship between stock performance and ESG ratings (Hong & Kacperczyk, 2009; Chava, 2014) but contradict a large number of studies finding a neutral (Hartzmark & Sussman, 2019; Managi et al. 2012; von Wallis & Klein, 2015) or positive relationship (Shanaev & Ghimire 2022; Kempf & Osthoff, 2007), prompting the need for further investigation. The study finds a similar directional relationship in Sweden and India. However, the strength differs, adding valuable inputs into the scarce literature on differences and similarities between developed and emerging markets. Although the scope of the study has been limited, it serves as an important stepping stone for future research toward unravelling the complexities of ESG and stock performance present in literature. The results further underscore the need to consider regional and market-specific factors, encouraging future research to incorporate these elements in order to create a more holistic view of the effects of ESG ratings.

5.4 Contribution and Implications for Practice

The findings of this thesis have a number of practical implications for investors, portfolio managers, companies, and policymakers in the financial community. From an investor standpoint, the results of this paper may at first glance seem to discourage ESG investing, particularly if the investor is solely driven by returns. However, another perspective is revealed once taking a more

nuanced approach. While the results show that low-ESG portfolios tend to outperform more sustainability inclined portfolios in both countries, investors should take note that this does not necessarily imply that investing in ESG is disadvantageous. Instead, this paper highlights important considerations for different types of investors relating to aspects such as ESG appetite, risk-return expectations, and market dynamics. Investors who are more socially conscious may prioritise investments with higher ESG rankings in pursuit of hedging themselves against the more volatile nature of low-ESG assets, especially in markets with higher average ESG preferences and stricter regulations. By understanding this relationship and the dynamics of the market you are investing in, investors and portfolio managers can better balance the ESG risk-return trade-off.

From a firm's perspective, if high-ESG results in a lower discount rate, this should encourage firms to engage in ESG activities. As previously discussed, the reason for this is that investors seem to be increasingly willing to trade returns for greener investments, thereby lowering the cost of capital for firms. Consequently, this should induce discussions in the boardroom to ensure that firms are aware of the opportunities and risks associated with ESG in all aspects of business. For instance, companies can benefit from the inflow of capital induced by a high-ESG rating and use this to invest in value-adding activities. Moreover, the punitive scenario depicted by Cornell and Damodaran (2020) should urge low-ESG firms to embrace ESG initiatives in order to reduce the discount rate, while simultaneously hedging against disaster and reputational risks. In essence, this paper suggests that engaging in ESG does not necessarily need to be inconsistent with profit-maximisation, and by recognising this, companies can promote long-term success for both themselves and society as a whole.

Finally, the results of this study can be used to assist policymakers in promoting efficient capital markets. In order to ensure that investors are equipped with the necessary tools to make well-informed decisions, it is imperative that all information is available. By implementing stricter and consistent regulations for corporate ESG reporting, financial transparency should be heightened in both countries. Furthermore, a standardised ESG score should be considered to ensure legitimacy and credibility of the entire framework of ESG ratings. These actions together, should help increase ESG awareness, and the implications it has for investments.

5.5 Limitations and Research Outlook

As aforementioned, this study serves as a piece of a larger puzzle, and can therefore not draw any wider conclusions. Consequently, a number of limitations should be addressed through more comprehensive research. First of all, since this study only uses Bloomberg as provider of ESG ratings, the transferability and generalizability of results will be limited. Since outcomes of previous research have shown to be dependent on the choice of ESG rating provider (Halbritter & Dorfleitner, 2015), the authors of this study suggest that future research should consider incorporating ESG ratings from different providers. Using an aggregate ESG metric from several sources could not only enhance accuracy, but also offer a more comprehensive explanation to the differences in research outcomes. Future research should also consider the benefits of standardising the ESG rating framework, and help promote an ESG score that is high in validity and reliability.

Another limitation to this study is the effects of the Covid-19 pandemic, which caused significant fluctuations in stock exchanges worldwide. During this period, it is possible that the behaviour and risk perception of investors was altered, which in that case may have had an effect on the outcomes of this paper. For this reason, future research should consider investigating the relationship between ESG and stock performance in a pre- and post-Covid setting. Moreover, the authors believe that the discussion on market dynamics could benefit from a more comprehensive analysis of industries.

From a statistical perspective, having 96 observations for each ESG portfolio can be considered a small sample size. As previously stated, this has to do with Bloomberg's ESG data being limited to the period between 2015-2022. To further strengthen the results, the authors propose that the study should be conducted again once new data points become available. Another way to achieve a larger sample size and to better examine the effects in emerging markets, the sample could also expand by looking at more emerging market countries.

At last, a key characteristic of the modern economy is the integrated financial markets. In the Indian stock market, 16% of investments are held by foreign investors (Mampatta, 2024), whereas in Sweden that number is 40%. Out of these, a clear majority comes from other developed countries such as the United States and the United Kingdom (SCB, n.d.). Naturally, the convergence of national and foreign investors makes it more difficult to capture characteristics solely inherent to the domestic investors of each country. With this in mind, future research could control for the degree of foreign investors in order to more accurately identify divergences in investor behaviour across geographical regions. Additionally, the authors suggest that a qualitative study might be a necessary complement to current literature. By extending beyond quantitative theory, such a study would be better suited to capturing the nuanced nature of investor reasoning and understanding the factors that influence the degree to which investors consider ESG.

6. Conclusion

In the outset of this paper, it was described how Environmental, Social and Governance practices have become increasingly central within the realm of sustainable investing. Despite gaining considerable traction in both academia and practice, opposing views on the true effect of ESG on stock performance continue to divide scholars and investors. Additionally, the notable gap in research on emerging markets further complicates the debate, underscoring the need for further academic endeavour. For that reason, the authors of this paper delved into the debate with the aim of analysing how a company's ESG score impacts stock performance, and to determine whether disparities exist in this relationship between developed and emerging markets.

Based on well-established financial theory, models, and prominent empirical research in the field, this paper conducted a cross-country comparison between Sweden and India. By analysing several regression models, particularly the Fama French 5-Factor model, the results from the study suggest that expected returns are higher for high-ESG investments than for low in both Sweden and India. Moreover, the directional effect appeared statistically stronger for Sweden as evidenced by a higher alpha, suggesting that there might be inherent differences in investor behaviour towards

ESG. Furthermore, the effect of the ESG valuation premium appeared stronger in Sweden, whereas the additional risk investors have to take on for investing in low-ESG assets showed to be smaller in India. Evidently, this underscores the importance of market differences for the relationship.

Although the study suggests that portfolios with lower ESG scores yield higher expected returns, the need for sustainable investors in light of today's climate change is higher than ever. The results indicate that from an investor standpoint, the metaphorical money tree of ESG investing does not bear the fruit of higher stock returns. Yet, for green firms, ESG investments seem to reward them with greater market value and lower cost of capital. Ultimately, more research is needed to fully establish how investments rooted in ESG practices will flourish in different regions over time.

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Appendix

Figure 2. Correlation tables conducted in STATA to assess multicollinearity

Matrix of correlations High-ESG Sweden

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Excess returns	1.000						
(2) Rm-Rf	-0.113	1.000					
(3) SMB	-0.205	0.069	1.000				
(4) HML	0.160	-0.316	-0.207	1.000			
(5) MOM	-0.062	-0.117	0.040	-0.438	1.000		
(6) RMW	0.257	0.273	-0.612	-0.049	-0.139	1.000	
(7) CMA	0.007	-0.485	-0.307	0.792	-0.150	-0.100	1.000

Matrix of correlations Low-ESG Sweden

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Excess returns	1.000						
(2) Rm-Rf	-0.127	1.000					
(3) SMB	-0.229	0.069	1.000				
(4) HML	0.244	-0.316	-0.207	1.000			
(5) MOM	-0.110	-0.117	0.040	-0.438	1.000		
(6) RMW	0.296	0.273	-0.612	-0.049	-0.139	1.000	
(7) CMA	0.095	-0.485	-0.307	0.792	-0.150	-0.100	1.000

Matrix of correlations High-ESG India

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Excess returns	1.000						
(2) Rm-Rf	-0.051	1.000					
(3) SMB	0.148	0.189	1.000				
(4) HML	0.084	0.248	0.519	1.000			
(5) MOM	0.043	-0.249	-0.313	-0.449	1.000		
(6) RMW	-0.096	-0.394	-0.800	-0.564	0.444	1.000	
(7) CMA	0.023	0.028	0.320	0.565	-0.141	-0.393	1.000

Matrix of correlations Low-ESG India

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Excess returns	1.000						
(2) Rm-Rf	-0.034	1.000					
(3) SMB	0.153	0.189	1.000				
(4) HML	0.033	0.248	0.519	1.000			
(5) MOM	0.027	-0.249	-0.313	-0.449	1.000		
(6) RMW	-0.068	-0.394	-0.800	-0.564	0.444	1.000	
(7) CMA	-0.056	0.028	0.320	0.565	-0.141	-0.393	1.000

Figure 3. Scatterplot conducted in STATA to assess linearity of the factors in India

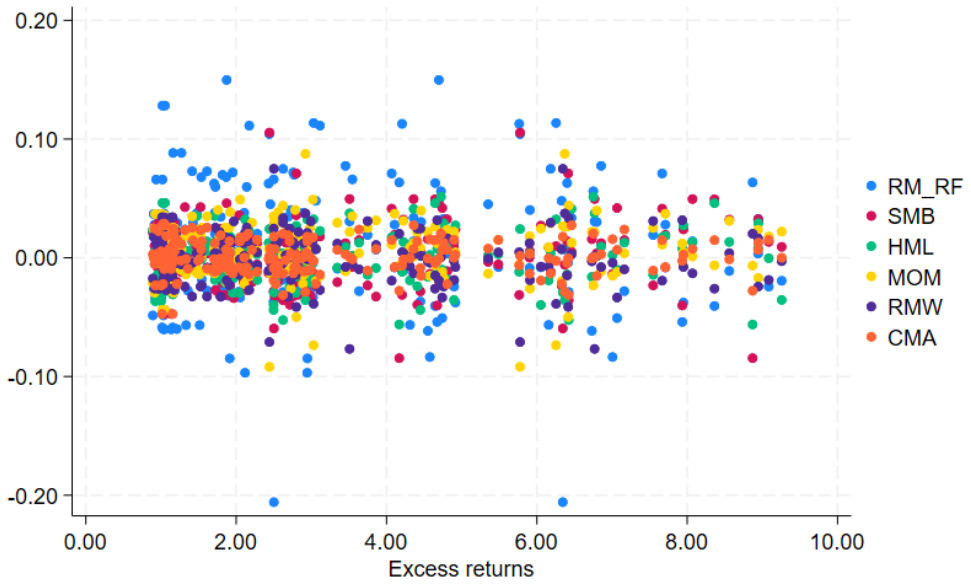

Figure 4. Scatterplot conducted in STATA to assess linearity of the factors in Sweden

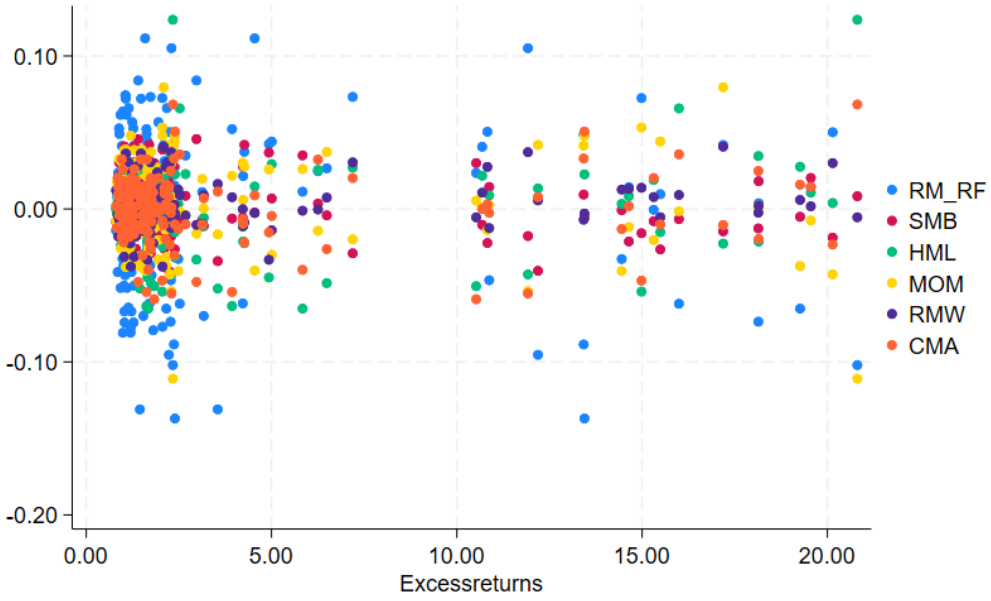

Figure 5. Scatterplot of residuals in the 5-factor model to assess independence for India

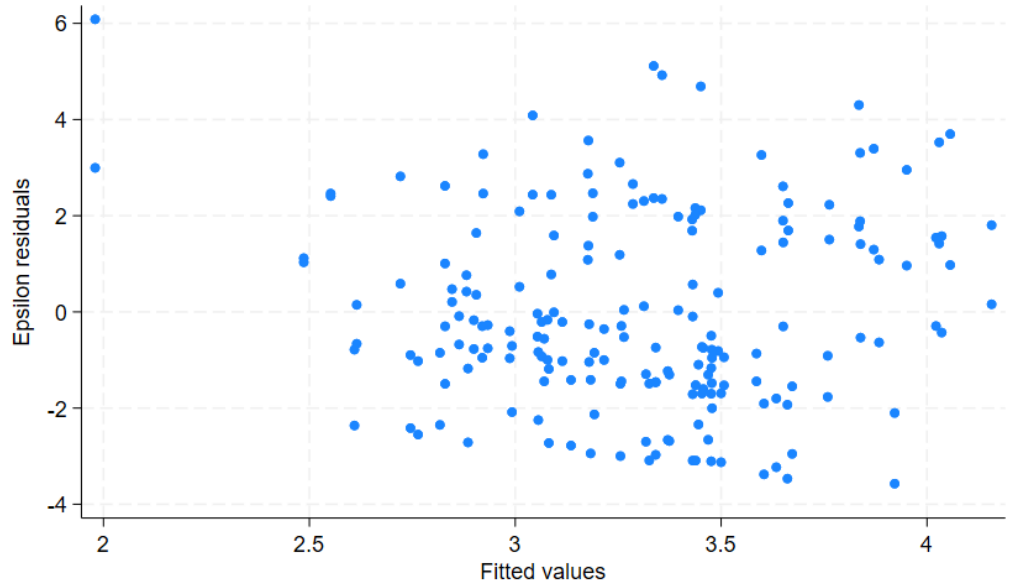

Figure 6. Scatterplot of residuals in the 5-factor model to assess independence for Sweden

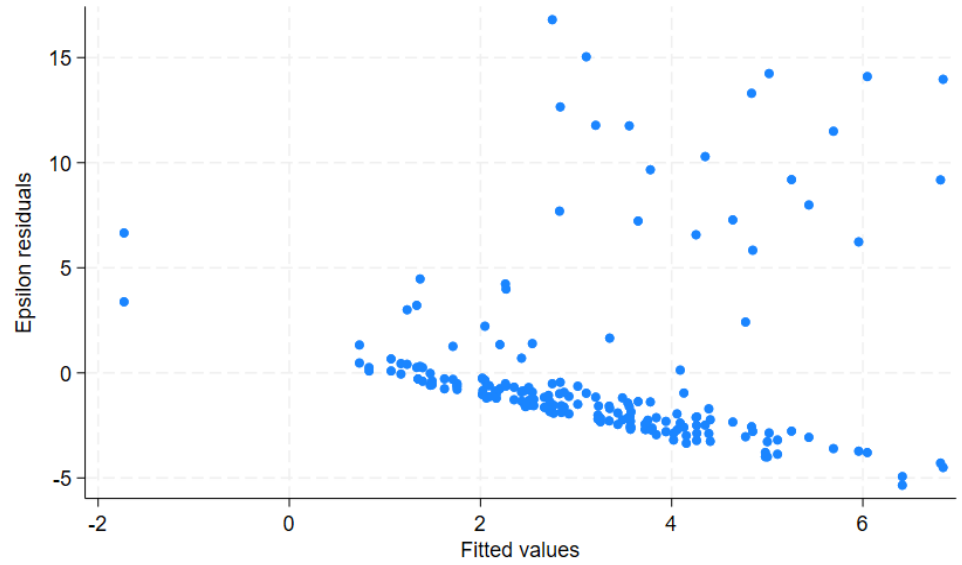

Figure 7. Kernel density estimate conducted in STATA to assess the normality of errors for Sweden

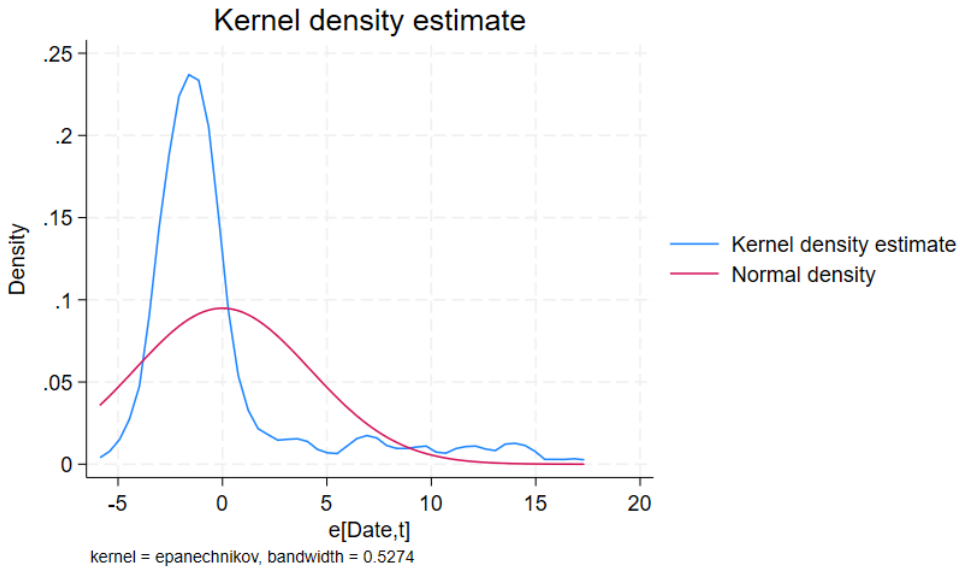

Figure 8. Kernel density estimate conducted in STATA to assess the normality of errors in India

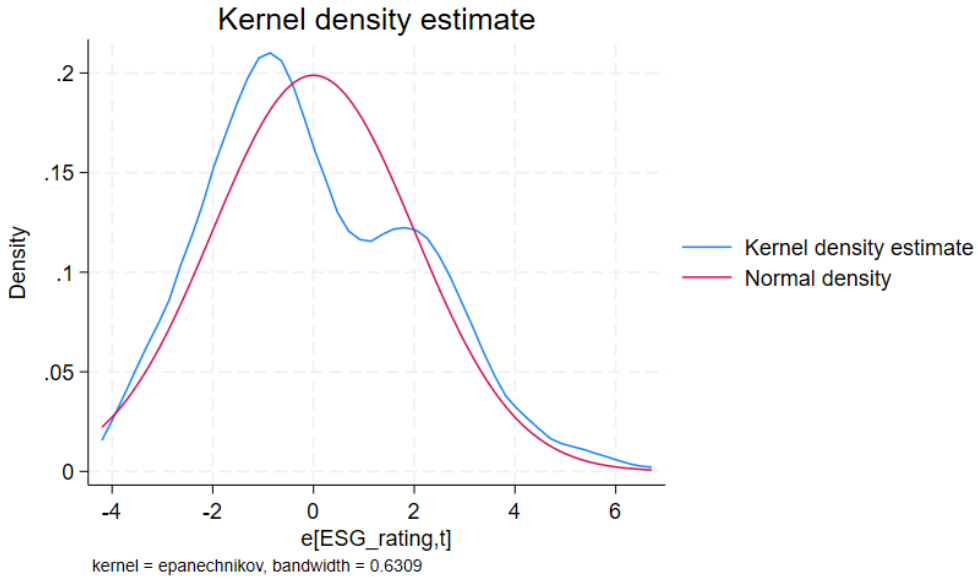

Figure 9. Variance Inflation Factors conducted in STATA to assess multicollinearity

Variance inflation factor Sweden

	VIF	1/VIF
CMA	3.617	.277
HML	2.762	.362
SMB	2.101	.476
RMW	2.03	.493
RM RF	1.435	.697
Mean VIF	2.389	.

Variance inflation factor India

	VIF	1/VIF
RMW 95	3.766	.266
SMB 95	2.987	.335
HML	1.84	.544
CMA 95	1.667	.6
RM RF	1.265	.79
Mean VIF	2.305	.

Authorship Statement

This thesis is co-written by the authors Ella Appelholm, Amanda Kuhn, and Cassandra Åstenius, all students at the BSc in International Business programme at Lund University. The text is ascribed to all authors throughout the entire text, which has been produced and edited in a collaborative manner.

AI Usage Statement

The authors acknowledge the use of AI tools when writing this thesis, which include the tools ChatGPT and Grammarly.com. The tools have been used sparsely in accordance with the stated guidelines, with the purpose of correcting grammar mistakes, checking spelling, and rephrasing sentences. Grammarly.com was used on the entire paper to check for misspellings of words and incorrect punctuation. No prompts were used in Grammarly. Parts of the text were pasted into the program where misspellings and incorrect grammar was highlighted, similar to Word's autocorrect program. The sections that used ChatGPT for correcting grammar mistakes and rephrasing a few sentences include Background, Problematisation, Sustainable Finance Theories, Discussion, and conclusion.

Examples of prompts used in ChatGPT include:

"Please check that the spelling and grammar for this sentence is correct"
"Please rephrase this sentence so that the grammar is correct"