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Is the Swedish Equity Analyst Just an ESG Salesperson?

Does a firm's ESG performance affect sell-side equity analysts' target prices?

Abstract

This thesis aims to understand if Swedish sell-side equity analysts evaluate firms' ESG performance and whether they recognize ESG performance as a factor that creates firm value. Data is collected for Swedish companies currently listed on the Stockholm Stock Exchange (Mic: XSTO) for the years 2008-2022. To test the hypotheses several OLS regressions are performed. The results show that the relationship between ESG performance and stock price potential is significantly positive. This suggests that financial analysts recognize a premium for companies that are more committed to ESG transparency, which is consistent with both theory and previous research outside the Swedish context. The results hold even when considering alternative model specifications. Furthermore, the results also show that the potential stock price gains from improved ESG performance decrease over time, due to ESG being priced in the market.

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1. Introduction

A growing number of companies are introducing various environmental, social, and governance (ESG) initiatives, according to an industry report by Pérez et al. (2022). Furthermore, Henisz et al. (2019) argue in an industry paper that these initiatives entail voluntarily disclosing non-financial information and embedding those aspects into business models as well as operations to meet the needs of various stakeholders, not just shareholders. According to a KPMG (2022) report, 96 % of G250 companies report on sustainability or ESG matters. Meanwhile, information intermediaries such as Sustainalytics, Bloomberg ESG, and Refinitiv Eikon ESG are being introduced, and voluntary reporting standards like the Global Reporting Initiative (GRI) are implemented. In turn, the adoption and implementation of ESG disclosure and the availability of ESG scores are attracting growing interest from sell-side equity analysts. As key stakeholders and experienced information brokers, analysts reduce information asymmetries between companies and investors (Ramnath et al., 2008). Therefore, it is important to understand whether they evaluate ESG performance and if so, how it affects company valuations.

Using US data, Ioannou & Serafeim (2015) show that analysts increasingly rate companies with high ESG scores with less pessimistic recommendations over time. They argue that there has been a gradual shift from an initial unfavourable evaluation of firms with high corporate sustainability scores to a more optimistic one, due to a shift in analysts' response to ESG. Thus, when analysts perceive corporate sustainability as serving managerial objectives (i.e., as an agency cost), they make pessimistic recommendations for companies with high corporate sustainability scores. As ESG has gained more legitimacy in the eyes of both investors and analysts, it is recognized as a set of activities that companies can undertake as insurance-like protection for relationship-based intangible assets (Godfrey, 2005) or as activities that can contribute positively to profitability (Margolis et al., 2009). If analysts view ESG performance as a factor that can create value (rather than an agency cost) through for example signaling lower risk (Huang, W. et al., 2022), companies with higher ESG performance should receive higher target prices from analysts and vice versa.

This thesis is motivated by the ongoing debate about whether ESG efforts are value-enhancing or window dressing. On the one hand, articles like Hsu et al. (2019) have shown that corporate social engagement can be a sign of management ethics and integrity, which is consistent with the stakeholder theory. For example, research suggests that better ESG disclosure is associated with positive financial outcomes, such as higher firm value (Eccles et

al., 2011; Matsumura et al., 2014), lower information asymmetry (Bernardi & Stark, 2018; Dhaliwal et al., 2012), higher analyst coverage (Zhang et al., 2020), and lower corporate risk (Albuquerque et al., 2019). On the other hand, studies like Adhikari (2016), Mahoney et al. (2013), and Parguel et al. (2011) claim that ESG reporting could be biased and is something that companies do as impression management. They question the accuracy of ESG communication and argue that corporate sustainability measures are sometimes seen as greenwashing that incurs agency costs and therefore is a cause for public skepticism.

We have chosen to study the Swedish stock market, the Stockholm Stock Exchange (Mic: XSTO), and there are several reasons to why it is interesting from a sustainability perspective. First, mandatory environmental reporting was introduced in the 1990s, and an industry report by PwC (2020) finds that most large companies issued voluntary non-financial reports ten years later. The report further states that Sweden was the first country in the world to require state-owned companies to publish sustainability reports and third-party assurance on non-financial data, in line with the Global Reporting Initiative. Second, Sweden is the largest stock exchange in the Nordic and Baltic region and the fifth largest market in Europe by market capitalization (Statista, 2023). Finally, Dhaliwal et al. (2012) show that European countries are generally more stakeholder-oriented[1] than the United States. For example, Maignan (2001) find that US customers place high value on corporate economic responsibility, while French and German customers place more value on corporate compliance with legal and ethical standards. Europeans are thus more likely to actively support responsible companies than their US counterparts.

1.1 Contributions

This study contributes to several aspects of previous research in the rapidly growing literature on how analysts respond to ESG scores. First, we seek to quantify the impact of ESG disclosure on sell-side analysts' valuation of companies. Although awareness and appreciation of sustainability-oriented finance has increased, research on how ESG performance influences sell-side equity analysts' valuation of companies is still in its infancy. An extensive review by Hinze & Sump (2019) finds that previous studies in the area have predominantly focused on financial analyst metrics such as analyst coverage, forecast accuracy and dispersion, and analyst perceptions of ESG. By focusing on ESG disclosure scores our thesis explores if

[1] Their empirical proxies for stakeholder orientation corresponds to several attributes of stakeholders, legitimacy, power, and salience that are used in stakeholder theory to describe the supremacy of stakeholders (Mitchell et al., 1997)

companies that are more committed to ESG transparency are affected, for example receiving higher target prices from sell-side analysts in their research reports. Therefore, we contribute to the ESG literature that seeks to understand the link between ESG performance and the derivation of firm value in financial markets.

Second, ESG has received increasing attention in Sweden, and the country is often seen as a pioneer in environmental protection (Isaksson & Rosvall, 2020). This article is the first to examine the role of sell-side equity analysts and their responses to ESG performance on their target prices in Sweden. Thus, one of our main contributions is to examine the Swedish context.

Finally, this study also contributes to the literature that focuses on the overarching institutional behaviors in financial markets (Zajac & Westphal, 2004; Zuckerman, 1999). More specifically, we contribute to the subset of the literature that examines the role of financial analysts (as intermediaries) in times when the prevailing institutional logic[2] is changing (Zajac & Westphal, 2004; Zuckerman, 1999). Our work extends the scope of this literature by investigating whether there is a time effect of ESG such that the analysts' perceptions and evaluations of ESG information changes over time.

1.2 Purpose of study

Given the gap we have identified in current literature, we examine the effect of environmental, social, and governance (ESG) performance on sell-side stock analysts' target prices. This thesis aims to understand if Swedish financial analysts evaluate a company's ESG disclosure score and whether they recognize ESG performance as a factor that creates firm value. One way to measure this is with the potential upside of a stock, which takes into account analysts' perceptions and preferences. If analysts take ESG performance into consideration when calculating target prices, this would be reflected as a premium in the potential upside of the stock.[3] Thus, ESG could be a hidden treasure for companies and increase corporate value. Therefore, this study aims to answer the following research question:

"Does a firm's ESG performance affect sell-side equity analysts' target prices?"

[2] The "prevailing institutional logic, i.e., the broader belief systems that shape the perceptions and behaviors of social actors" (Thornton & Ocasio, 1999)

[3] For a detailed explanation of the calculation of a stock's potential upside, see Section 4.3.

1.3 Research boundaries

We use a sample of companies listed and registered in Sweden, and the thesis is therefore limited to the Swedish stock market. The sample period is 2008 to 2022, as we require continuous and comprehensive ESG data. We expect this could influence results as sentiments from prior years are not captured in addition to the sample size being limited. The quality and disclosure of sustainability reports are not examined, as this would require large resources and could be difficult to keep consistent. Instead, ESG disclosure scores from independent rating agencies are used. In addition, the price potential of a stock is calculated based on consensus target prices published by financial analysts, so the sample is limited to companies that are covered by analysts. For the purpose of this thesis, ESG performance and ESG disclosure are used interchangeably, see section 4.4 for further discussion.

1.4 Outline

The remainder of this thesis is organized as follows. Chapter 2 presents the theoretical framework, previous research on ESG, and sell-side analysts. The general hypotheses are presented in Chapter 3. Chapter 4 describes and justifies the chosen methodology and sample. Chapter 5 presents the results and analysis of our statistical tests. Chapter 6 discusses our results, assumption reliability, and robustness tests. Finally, in Chapter 7, we conclude our study and make suggestions for future research. Chapters 8 and 9 contain references and appendices, respectively.

2. Literature review and theoretical framework

In this section, we present previous research around ESG and sell-side equity analysts', which forms the basis for our study. In this part of our thesis, we also present the theoretical framework.

2.1 ESG

Pérez et al. (2022) argue in an industry paper that ESG is a widespread concept in business and financial markets. It covers how companies address environmental, social, and governance issues to achieve sustainable development, rather than focusing solely on profit maximization (Luo, K. & Wu, 2022). While the scope and dimensions of ESG can vary depending on the definition, the central idea is that it is an analytical framework that helps measure and quantify an organization's level of sustainability in each pillar[4] (Billio et al., 2021). ESG is based on the simple idea that companies can generate and deliver high returns whilst creating value for all stakeholders. ESG analysis therefore focuses on how companies serve society and how this affects their current and future performance (Porter & Kramer, 2006).

2.1.1 Value-enhancing or value-destroying

Academic literature generally has two main views on corporate sustainability engagement: the value-enhancing theory and the value-destroying theory (Ferrell et al., 2016). The theory that argues for a negative relationship between corporate sustainability and financial performance is the shareholder theory, which was introduced by Friedman (1970). It states that a manager's primary duty is to maximize shareholder value, even at the expense of external factors, as long as they are within the law. Extending this view, Bénabou & Tirole (2010) argue that social responsibility activities often lead to governance problems within the firm, such that socially responsible companies usually suffer from agency problems[5]. These include managers who engage in sustainability activities to fulfill their self-interest at the expense of shareholders. In addition, managers who engage in time-consuming sustainability activities may lose focus on their actual management task (Jensen, 2001). These agency problems have negative financial implications through loss of efficiency and competitiveness (Bénabou & Tirole, 2010; Jensen, 2010). As a result, the relationship between ESG activities and financial performance is argued

[4] Pillar refers to the three pillars of ESG, Environmental (E), Social (S), and Governance (G) factors.
[5] An agency problem is a conflict of interest inherent in any relationship in which one party is expected to act in the best interest of the other. For instance, an agency problem usually refers to a conflict of interest between a company's management and the company's shareholders.

to be negative because the resulting benefits do not exceed the costs (Fatemi et al., 2018). Consequently, the companies that are free from such additional constraints will be relatively more competitive and consequently more profitable in a competitive environment (Jensen, 2010).

The other approach, advocated by Freeman (1984), is called the stakeholder theory and focuses on considering all stakeholders in decision making, including customers, employees, investors, and the general public. According to the theory, companies that manage their stakeholder relationships well will survive longer and achieve better results than companies that do not (Freeman, 1984). A company's sustainability activities help reduce conflicts of interest between the company and its stakeholders, thereby increasing financial performance and shareholder value (Bartlett & Preston, 2000). In addition, previous studies argue that ESG can mitigate conflicting regulatory, legislative, or tax policies (Berman et al., 1999; Hillman & Keim, 2001), attract financial resources from socially engaged investors (Kapstein, 2001; Luo, X., Wang, Raithel, & Zheng, 2015), attract socially conscious customers (Hillman & Keim, 2001), and improve access to finance (Cheng et al., 2014). In short, ESG can be congruent with maximizing shareholder wealth and achieving broader societal goals (Ferrell et al., 2016).

Consistent with the value-creating view of ESG, several empirical studies have found a positive correlation between corporate social performance and financial performance, albeit without directly exploring the perception of ESG by investment analysts (Huang, X. & Watson, 2015). In a recent meta-study report, Whelan et al. (2021) examine more than 1,000 individual papers published over the past five years. They find that more than 60% of these papers showed a positive relationship between ESG and financial performance, demonstrating that investing in sustainability can lead to greater growth and returns through innovation, greater operational efficiency, and better risk management. Using a matched-sample methodology, Eccles et al. (2014) also find that sustainable companies, defined as companies that voluntarily integrate social and environmental concerns into their strategy and business model, do better than their less sustainable peers over an 18-year period in both stock market and operating performance. This suggests that ESG performance is relevant for firm value and can complement financial information.

2.1.2 Building legitimacy through ESG

Another theory explaining why firms should disclose voluntary non-financial information is the legitimacy theory. This theory is based on the idea that there is a social contract between

society and an organization. The theory emphasizes the importance of social acceptance for the survival of a company (Singh et al., 1986). Suchman (1995) defines legitimacy as "a generalized perception or assumption that a firm's actions are desirable, correct, or appropriate within a socially constructed system of norms, values, beliefs, and definitions." A business is ultimately accountable to society for how it operates and what it does because society grants businesses the authority to own and use natural resources and hire employees (Deegan, 2004). Traditionally, profit maximization has been viewed as the measure of corporate performance. However, according to legitimacy theory, profit is considered an all-encompassing measure of corporate legitimacy (Ramanathan, 1976). An organization must therefore consider the rights of the public, not just the rights of shareholders. As a result, companies use ESG disclosure as a tool to demonstrate social consciousness and behave acceptably in relation to stakeholder expectations (Dowling & Pfeffer, 1975; Palazzo & Scherer, 2006). By disclosing their social responsibility, companies can thus indirectly strengthen the legitimacy they receive from the community and influence the value of the company in the eyes of investors and the broader community.

A lot of prior ESG research uses the legitimacy theory to examine social and environmental reporting and proposes a relationship between corporate disclosure and community expectations (Deegan, 2004). Reverte (2009) and Tamimi & Sebastianelli (2017) find that large companies tend to disclose more ESG information than smaller ones. As company size increases, additional resources and visibility strengthens the relationship between ESG and their results (Aguinis & Glavas, 2012). Larger companies are better structured to promote external communication and ESG reporting than smaller companies. It is also of note that legitimacy is not something that a company can acquire and build upon, as it is conferred by society and can be withdrawn. Companies must therefore find ways to maintain relationships with the community.

2.1.3 The institutionalization of ESG

Building on legitimacy theory, institutional theory addresses the relationship between business and society, and advances understanding of the effectiveness of ESG within the institutional dimension of economic governance (Brammer et al., 2012). This thesis assumes that corporations are incentivized to conform with broader societal structures, such as public and private regulation and the presence of non-governmental and other independent organizations

that monitor corporate behavior. This connection ultimately drives an organization to the need to gain, maintain, and regain legitimacy.

Disclosure of non-financial ESG data and an organization's voluntary engagement in ESG activities are considered part of institutional practice (Deegan, 2009). Stakeholder and legitimacy theories thus explain why managers of an organization pursue a particular strategy, such as voluntary disclosure of ESG data. In contrast, institutional theory tends to take a broader macroeconomic view to explain why an organization adopts a particular structure or reporting practice.

The legitimacy and institutional perspectives of ESG are not mutually exclusive. An organization's legitimacy can be viewed from different theoretical perspectives, and the institutional theory is one of them. Thus, when ESG disclosure is studied from an institutional perspective, the organization and its legitimacy are shaped by and primarily influenced by the external environment. Consistent with institutional theory, a firm's predicted ESG motivation is the desire to become similar to other firms by adopting the practices that are considered "normal" by society.

In short, organizations can meet social expectations and gain social acceptance (legitimacy theory) by obtaining the approval of powerful stakeholders (stakeholder theory) and by conforming to the established patterns of other similar social institutions (institutional theory).

2.1.4 ESG as a risk mitigation strategy

Several studies also show that ESG activities and disclosure can create value by reducing the risks associated with the company. For example, El Ghoul et al. (2011) show that companies with low corporate sustainability performance have higher undiversifiable risk, which leads to higher cost of equity financing, thus affecting the cost of capital. Similarly, Albuquerque et al. (2019) show that systematic risk is significantly and economically lower for companies with high sustainability scores. Bénabou & Tirole (2010) argue the long-term perspective of profit maximization through ESG by reducing the risk of for example future lawsuits, boycotts, and clean-up costs. However, all these factors mainly cover long-term risks and are therefore discounted in the valuations of analysts and the like, resulting in a lower overall effect.

2.2 The role of Swedish financial analysts'

Sell-side equity analysts, hired by investment banks and brokerage firms, are players in capital markets, acting as information brokers and reducing information asymmetries between companies and investors. To be effective, analysts must maintain close relationships with their clients and the companies they cover. After gathering company-relevant information, they process and disseminate it in the form of earnings forecasts, reports, and recommendations. The latter reflect the analysts' overall assessment of a company's prospects and are published as either buy, hold, or sell recommendations (Ioannou & Serafeim, 2015). With their results, financial analysts provide advice to investors, and an upgrade or downgrade thus might influence investment decisions. Since analysts are actors in capital markets, they can contribute to market price discovery by analyzing a wide range of information they gather and play a role in interpreting the information used in their reports (Palmon & Yezegel, 2012). Previous accounting and finance studies show that analysts' stock recommendations provide valuable information about publicly traded companies and can evoke significant stock price reactions (Mola et al., 2013; Womack, 1996). Fried & Givoly (1982) also show that analyst forecasts better reflect market expectations for a company's future earnings than time series models.

On the other hand, some argue that the role of financial analysts in the market is more nuanced. For example, Chung (2000) argues that analysts act as marketers for brokerage firms and focus mainly on increasing commissions from brokerage and sales of stocks by reporting on companies that are of most significant interest to investors. Brokerage firms thus accommodate investor preferences by focusing their marketing efforts, including analyst coverage, on stocks of high-quality companies. Hence, if investors believe that ESG creates firm value, equity analysts will cover companies that report ESG disclosure and include ESG performance as a value driver in their valuation models and analyses, which subsequently increase their target prices for these companies. They would then promote companies with high ESG performance to their clients to benefit from this marketing activity. Furthermore, Strauss & Zhu's (2004) findings confirm that equity research is a value-added activity for equity sales/trading. Although stock analysis provides limited information (Barber et al., 2001; Michaely & Womack, 1999), their results suggest that it is critical for banks because the quality and quantity of stock research generate substantial profits for sell-side firms through driving commissions (Chung, 2000). Considering that equity research provides little additional information to outperform the market, it can rather be argued to be an effective marketing and sales tool for sell-side firms.

2.3 ESG and analysts' target prices

Regarding the financial market's perspective on ESG disclosure, analysts bridge the gap between accounting and equity market perspectives of firm value (Ramnath et al., 2008). The arguments put forward by Ioannou & Serafeim (2015) are that the agency logic has weakened by bringing a broader stakeholder focus to the forefront. This draws on the gradual emergence and institutionalization of what has been called the "business case for ESG" (Margolis et al., 2009) and the collective recognition that ESG can be an insurance-like protection for a company's relationship-based intangible assets (Godfrey, 2005) as well as a risk mitigation strategy (Bénabou & Tirole, 2010).

Recent studies demonstrate significant value creation from ESG integration and disclosure under multiple profiles, including improved reputation (Khojastehpour & Johns, 2014), firm attractiveness (Albinger & Freeman, 2000), and lower cost of equity (Dhaliwal et al., 2011; El Ghoul et al., 2011). According to Baldini et al. (2018), ESG information disclosure can also demonstrate social awareness and meet stakeholder expectations, suggesting that ESG information disclosure might contribute to firm value and complements financial information. Dhaliwal et al. (2011) show that voluntary sustainability disclosure is associated with increased analyst coverage, improved forecast accuracy, and reduced forecast dispersion for companies with relatively high ESG performance.

In the ESG framework, financial analysts can reduce the information asymmetry associated with a company's social performance by including ESG disclosure in their recommendations to general investors (Luo, X. et al., 2015). Dhaliwal et al. (2012) show that analysts are increasingly including ESG issues alongside financial information as key risks and growth opportunities in their valuations. This means ESG factors are systematically incorporated into analysts' valuation models. In particular, Schramade (2016) proposes a value-driver-aligned approach that links traditional valuation models with ESG issues as value drivers via their impact on business models and competitive positions. Using a sample of 127 investment cases, they find that the average target price impact of ESG factors is 5% overall.

In summary, organizational policies achieve legitimacy to the extent that they are consistent with the broader belief systems that shape the cognition and behavior of actors – referred to as the institutional logic. The trends above point to an emerging shift in this institutional logic within the analyst community and financial markets, from an agency logic towards a stakeholder orientation and, thus, a reinterpretation of ESG disclosure as a legitimate

part of corporate strategy that minimizes operational risks and even contributes positively to long-term financial performance.

2.3.1 The underlying relationship between ESG and the potential upside

Another way to look at the connection of ESG performance and the potential price gains of a stock is to investigate if there is an increasing or decreasing relationship over time. Derwall et al. (2011) hypothesize the errors-in-expectations hypothesis, which states that investors underestimate the impact of ESG practices on future cash flows. This, in turn, leads to companies being undervalued and therefore earning abnormally high returns in the short term. However, these above-average returns diminish over time as investors gain better tools to measure ESG, can more accurately assess the value relevance of ESG activities, and thus start to include this in their investment decisions (Derwall et al., 2011). As a result, good ESG performance could be argued to increase firm value over time.

In the context of analysts' target price, the relationship between ESG performance and a stocks potential upside should therefore decrease over time as ESG scores become incorporated in the stock's market price[6]. As investors improve their understanding of the impact of ESG on companies' future cash flows, we expect above-average returns due to expectation errors to disappear. Consistent with the efficient market hypothesis, the more information available, the better the prices reflect the true value of companies. This reduces the scope for investors to identify ESG related information that is not already reflected in stock prices and thus, there is a lower potential stock price gain attributable to ESG performance.

Ioannou and Serafeim (2015) examined the impact of ESG performance on analysts' recommendations over time. They found US-evidence that the impact of high ESG performance on analysts' recommendations increased from negative to positive over 15 years. This is due to companies' sustainability practices no longer being perceived as an agency cost but as a potential value driver for the company, which reflects the growing trend of Socially Responsible Investments (SRI) (Sparkes & Cowton, 2004). The sustainability trend is also seen Sweden, where mandatory environmental reporting was introduced already in the 1990s, according to an industry report by PwC (2020). The report also states that Sweden was the first country in the world to require state-owned companies to publish sustainability reports and third-party assurance on non-financial data.

[6] For a detailed explanation of the calculation of a stock's potential upside, see Section 4.3.

3. Test logic and general hypothesis

The theoretical background and empirical research presented guide the focus of this thesis. In summary, financial analysts act as information brokers that reduce information asymmetries between firms and investors. By incorporating ESG performance into their valuations, analysts can further decrease the information asymmetry to outside investors. If a company's level of ESG performance positively impacts its target price, we hypothesize that financial analysts recognize ESG as a factor that can create value. When calculating the potential stock price gains, we can verify whether the ESG performance contributes to a higher stock valuation, thus determining an ESG performance premium. This leads us to formulate the first hypothesis:

H_1: There is a positive relationship between ESG performance and a stock's potential upside.

Having examined the relationship between ESG performance and the potential upside of a stock in the first hypothesis, we examine the impact of ESG performance over time. The error-in-expectations hypothesis states that it takes time for investors to recognize the fundamental value of ESG performance for future cash flows. As a result, companies with high levels of ESG disclosure are undervalued and therefore generate higher abnormal returns in the short run. However, these above-average returns diminish over time as investors increasingly improve their understanding of the impact of ESG and begin to incorporate ESG factors into their valuations. Thus, ESG performance is increasingly priced in the market value of the firm. Consequently, we hypothesize that the potential stock price gains specifically attributable to improved ESG performance logically declines. This leads us to formulate the second hypothesis:

H_2: The potential upside of a stock from improved ESG performance decreases over time.

4. Method

4.1 Data

The sample includes current Swedish listed companies based in Sweden to ensure a homogeneous institutional context. The dataset covers the period from 2008 to 2022. We create our sample by combining several databases, collecting ESG disclosure scores from Bloomberg, analyst forecasts and stock market data from the Refinitiv Institutional Brokers' Estimate System (I/B/E/S) database, and accounting data from Capital IQ. We use the following criteria to select our sample from an initial list of 995 companies listed in Sweden from the Refinitiv Eikon dataset. First, firms not rated in in the Bloomberg ESG Disclosure Score database at the end of 2022 are excluded. Second, we restrict ourselves to companies with target prices and analyst recommendations, i.e., companies without any target prices during the sample period are excluded. Finally, we retain the companies for which we had all other data needed to calculate a stock's upside potential and control variables. This selection process narrows our final sample to 64 companies over the 2008-2022 period with 750 firm-year observations. The screening of the sample is described in *Table 1*.

Table 1. Sample Screening

Sample	Sample Attrition	Unique Firms
Sample of Swedish Public Companies	n/a	995
Less Firms w/o ESG Score > 0	670	325
Less Firms w/o Target Price > 0	23	302
Less Firms w/ less than 4 years of ESG Scores	235	64
Final Sample		64

Firms are incorporated in Sweden and listed on a Swedish stock exchange. The final sample include panel data of 750 firm-year observations of all variables.

Table 2 shows the industry distribution in the sample. Most stocks belong to the industrial and non-cyclical consumption sectors, which together account for about half of the sample.

Table 3 in Appendix 1 shows the annual distribution of our sample, which reveals an increasing trend in the number of observations of our variables of interest. The number of observations per year varies due to data availability. The number of observations for each ESG score increases, which is due to the increasing availability of data points during our study period. In contrast, the number of observations for our dependent variable *UPSIDE* is almost

equal for every year of our sample period. This is explained by companies having analysts covering their stock but no ESG disclosure score.

Table 2. Sample Distribution Across Industries

Industry Category	Firms	Observations	Percentage
Health care	4	37	4.93%
Materials	6	83	11.07%
Real Estate	5	61	8.13%
Consumer Staples	2	17	2.27%
Consumer Discretionary	9	100	13.33%
Utilities	1	10	1.33%
Industrials	22	250	33.33%
Communication Services	4	54	7.20%
Financials	8	104	13.87%
Information Technology	3	34	4.53%
Total	64	750	100%

Firms categorized according to the Global Industry Classification Standards (GIGS), 10 out of 11 industries are represented in our sample.

4.2 Empirical model

4.2.1 Hypothesis 1

Baseline model

To test our first hypothesis, we use a multivariate Ordinary Least Squares (OLS) regression model in which sell-side analysts' target prices relative to the stock's closing price is the dependent variable and ESG disclosure scores is the primary independent variable. The stock's potential upside is regressed on the ESG performance proxy and control variables. This model assumes linearity over time, which should be interpreted with caution and is therefore also a limitation of using it. Due to the use of panel data, there is a possibility that the error term is not independent within industries or across years. This may be the case if some industries perform systematically differently than others due to long-term, constant factors. To correct for this unobserved heterogeneity, we include industry fixed effects in our model. There is also a risk that the error term is not independent over time (Greene, 2000). Therefore, year fixed effects are included in the regression model to eliminate year-specific events, such as macroeconomic factors associated with performance.

After adjusting for these fixed effects, a stock's upside potential is not affected by differences across years or across industries. All variables are explained in more detail in the following sections. The regression model for our first hypothesis is as follows:

$$UPSIDE_{it} = \beta_0 + \beta_1 ESG\_SCORE_{it} + \beta_2 MV\_BV_{it} + \beta_3 SIZE_{it} + \beta_4 ANALYSTS_{it} + \beta_5 ROA_{it-1} + \beta_6 CAPEX\_TA_{it-1} + \beta_7 INTANG\_TA_{it-1} + \beta_8 LEVERAGE_{it-1} + \beta_9 INDUSTRY_{it} + \beta_{10} YEAR_{it} + u_{it}$$

Where:

$UPSIDE$: The average (consensus) potential upside for a firms' stock price

ESG_SCORE: ESG performance proxy

MV_BV: Market-to-book ratio

$SIZE$: Natural logarithm of market capitalization

$ANALYSTS$: Analysts' following a focal firm in a focal year

ROA: Return on assets

$CAPEX\_TA$: Fixed assets purchased during the fiscal period as a percentage of total assets

$INTANG\_TA$: Intangible assets as a percentage of total assets

$LEVERAGE$: Financial leverage ratio, debt over assets

$INDUSTRY$: Industry fixed effects

$YEAR$: Year fixed effects

i: Cross-sectional unit, firm

t: Valuation year

The coefficient of interest is β_1. If the estimated coefficient is positive and statistically significant at the 5% level, we reject the null hypothesis.

$$H1_0: \beta_1 \leq 0, \qquad H1_1: \beta_1 > 0$$

Firm-fixed effects

For OLS regressions to work in the sense that the model can separate the effect of one of the independent variables from the error term, we need an exogeneity assumption. It states that the conditional expected value of the error term as a function of the independent variables is zero. If the exogeneity assumption is not true, we say that the regressors are endogenous, and we

have an endogeneity problem. This problem entails that one of the explanatory variables is correlated with the error term, resulting in biased or inconsistent coefficients. In our thesis, this would mean that an unknown factor determines both the potential upside of a stock and the ESG performance of the company, or that companies with high potential sock price gains are also the ones that afford to invest more heavily in ESG. This type of variation is undesirable because it is related to unobserved variables that can bias our estimates. One way to work against the problem of omitted variable bias is to eliminate as much unexplained variation as possible by including firm fixed effects (Wooldridge, 2012). We therefore include a dummy variable for each company to control for any time-constant and company-specific factors, such as good/bad management, that may not have been included in the original regression. Since the firm fixed effects variable only measures variation within a firm and not between firms, industry fixed effects are no longer necessary. To ensure maximum variation within firms, we also run the regression on a balanced panel of firms that have data for the entire sample period. The regression model is as follows:

$$UPSIDE_{it} = \beta_0 + \beta_1 ESG\_SCORE_{it} + \beta_2 MV\_BV_{it} + \beta_3 SIZE_{it} + \beta_4 ANALYSTS_{it} + \beta_5 ROA_{it-1} + \beta_6 CAPEX\_TA_{it-1} + \beta_7 INTANG\_TA_{it-1} + \beta_8 LEVERAGE_{it-1} + \beta_9 FIRM_{it} + \beta_{10} YEAR_{it} + u_{it}$$

Where:
$FIRM$: Firm fixed effects

The coefficient of interest is β_1. If the estimated coefficient is positive and statistically significant at the 5% level, we reject the null hypothesis.

$$H1_0: \beta_1 \leq 0, \qquad H1_1: \beta_1 > 0$$

4.2.2 Hypothesis 2

With the second hypothesis, we want to investigate whether the effect of ESG performance on the upside potential of a stock decreases over time. To test this, we employ a time variable that interacts with *ESG_SCORE*. This method is called a multiplicative interaction model and is used to examine whether a relationship between an outcome and an independent variable changes with a moderating variable (Hainmueller et al., 2019). However, the assumption of

linearity over time should be interpreted with caution and is also a limitation of using this model. In addition to the multiplicative interaction model, we use a simple regression model, like Ioannou & Serafeim (2015), that gradually increases the observation period by 3-5 years at a time. Thus, the model is repeated several times by extending the sample periods. Since this model uses a different sample size in each regression, it does not reveal the actual trend over time, which is why we use it as a complement to the multiplicative model.

We add the time variable that interacts with the ESG score to our baseline model to examine linearity over time. The variable *TIME * ESG_ SCORE* shows the effect on firm value for an additional year from 2008 and will be the new primary explanatory variable in the regression. The *TIME* variable will have a value of 1 in 2009, 2 in 2010, 3 in 2011, and so on. The regression model is as follows:

$$\begin{aligned} UPSIDE_{it} = {} & \beta_0 + \beta_1 ESG\_SCORE_{it} + \beta_2 TIME_{it} + \beta_3 TIME_{it} * ESG\_SCORE_{it} + \beta_4 MV_{BV\,it} \\ & + \beta_5 SIZE_{it} + \beta_6 ANALYSTS_{it} + \beta_7 ROA_{it-1} + \beta_8 CAPEX_{TA\,it-1} \\ & + \beta_9 INTANG_{TA\,it-1} + \beta_{10} LEVERAGE_{it-1} + \beta_{11} FIRM + \beta_{12} YEAR + u_{it} \end{aligned}$$

The coefficient of interest is β_3. If the estimated coefficient in year *t* is negative and statistically significant at a 5% level, we reject the null hypothesis.

$$H2_0: \beta_3 \geq 0, \qquad H2_1: \beta_3 < 0$$

4.3 Target price and potential upside

To test the impact of the ESG performance on financial analysts' valuations, we focus on the difference between the stock price and the average target price published by the analysts who cover the stock. Since the target price of the stock is the expected market price over a 12-month horizon, the higher the target price relative to the market price, the higher the upside potential of the stock. Empirically, few academic papers have focused on the impact of ESG performance on analysts' target prices. Instead, they rely mainly on investment recommendations. For example, Ioannou & Serafeim (2015) and Zhang et al. (2020) focus only on the impact of investment recommendations, which consist of a score between 1 and 5 and are associated with strong buy and strong sell recommendations, respectively. An exception is Bolognesi & Burchi (2023), who focus on target prices rather than other research measures. They argue that analysts' target prices are a more meaningful measure of analyst optimism because they forecast

the potential upside of stocks and thus quantify analysts' opinions in more detail. Hence, we call our dependent variable *UPSIDE*. In our analysis, target prices are provided by I/B/E/S and are defined as the average target prices reported by financial analysts who cover the stock. We use monthly target prices to increase the robustness of the variable *UPSIDE*; thus, we capture the stock's price potential on a monthly basis. For each year, we compute *UPSIDE* as the annual average of monthly upside movements:

$$UPSIDE = \sum_{m=1}^{12} \left(\frac{TP_m}{P_m} - 1\right)\frac{1}{12}$$

Where,

TP_m: The stock's consensus target price at the end of month m

P_m: The last closing price of the month m.

The unit of *UPSIDE* is expressed in decimal form, and the estimated coefficients are interpreted as the effect of a change in percentage points. In other words, the potential *UPSIDE* is the amount (in percentage terms) that analysts expect the price of a stock to increase. For example, if *UPSIDE* equals 0.1 that would suggest a 10% potential stock price gain. To improve the reliability of our dataset, we exclude all observations associated with average target prices calculated with fewer than two target prices.

4.4 ESG performance

Following several previous studies, the proxy for ESG performance used in this study is based on Bloomberg ESG Disclosure Scores, which is based on the extent of a company's Environmental, Social, and Governance (ESG) disclosure (Bernardi & Stark, 2018; Eccles et al., 2011; Eccles et al., 2014). The Bloomberg ESG Disclosure Score only measures the amount and quality of ESG data a company reports publicly and does not measure the actual company performance on any data point.[7] Alsayegh et al. (2020) and Lopez de Silanes et al. (2020) have found a positive relationship between ESG disclosure and ESG performance, and therefore we argue that the Bloomberg ESG Disclosure Score is a reasonable proxy for ESG performance. Furthermore, as there are differences in what ESG score providers measure and how they compile data, this might influence our results. This is discussed in section 6.1.2. and a

[7] For a further discussion of different ESG disclosure scores and the reliability of our ESG proxy assumption, see section 6.1.2

comparison between the Bloomberg ESG Disclosure Score and Refinitiv Eikon ESG Score is illustrated in *Table 13*.

We choose the Bloomberg ESG Disclosure Score over other ESG Disclosure Score providers for several reasons. First, the score includes more European and thus Swedish companies than, for example, the MSCI KLD score, which is otherwise widely used in the academic literature (Fisman et al., 2005; Godfrey et al., 2009; Graves & Waddock, 1994; Mattingly & Berman, 2006; Turban & Greening, 1997). Second, we found a higher overall number of firm-year scores in Bloomberg than in, for example, the Refinitiv Eikon ESG database. Finally, the key advantage of the Bloomberg ESG database is that, according to the Bloomberg website (2023), the score captures the level of ESG criteria transparency and can thus be considered as a mirror of a company's own commitment to transparency.

Scores range from 0 for companies that disclose only a minimum of ESG data included in the score, to 100 for companies that disclose every data point collected by Bloomberg. While the topics and data fields included in the score have been selected based primarily on industry agnostics frameworks, certain topics may not apply to all industries. Each pillar is equally weighted in the overall ESG score, each topic within a pillar is equally weighted and topic weights are allocated across fields related to the issue, and quantitative fields weighted more heavily than binary fields.

According to the Bloomberg website (2023), data is collected from integrated annual reports, sustainability reports, corporate governance reports, and other publicly available documents[8]. The environmental pillar score measures how well a company uses best management practices to avoid environmental risks and takes advantage of environmental opportunities. The social pillar score measures a company's ability to build trust and loyalty among its employees, customers, and the community through best management practices. It reflects the company's reputation and the condition of its license to operate, which are critical factors in its ability to generate long-term shareholder value. The corporate governance pillar measures a company's systems and processes for ensuring that board members and executives act in the best interests of long-term shareholders by creating incentives and controls. Examining each pillar separately with the variable *UPSIDE* can provide insight into the impact of each dimension on the effectiveness of the company's ESG strategy.

[8] The information about Bloomberg ESG Disclosure Score is obtained from Bloomberg itself and its external website www.bloomberg.com

4.5 Other independent variables

We identify other standard independent variables from the prior literature that serve as control variables for analysts' target prices. These can be divided into market-based and accounting-based variables, with the accounting-based control variables lagged by one year. The first market-based control variable is *SIZE* (+)[9], which is based on a firm's logarithmic market capitalization. Prior literature argues that analysts may make more favorable recommendations for larger firms because trading these firms generates more trading commissions and investment banking business, resulting in better compensation for the analyst (Ioannou & Serafeim, 2015). We also use the market-to-book ratio, *MV_BV* (-), which shows investors how the market views the value of a stock and indicates how much stock investors pay for each dollar of net assets. Therefore, a high value of this ratio may be associated with overvaluation of the stock and subsequently signals a lower upside potential (Jegadeesh et al., 2004).

The accounting-based control variables are return on assets, *ROA* (+), as an indicator of profitability and management efficiency, as well as capital expenditures as a percentage of total assets *CAPEX_TA* (+) and intangible assets as a percentage of total assets *INTANG_TA* (+) to determine whether a firm is growing through acquisitions or investing in capital projects. We expect positive coefficients for all three variables (Jegadeesh et al., 2004). Finally, we measure *LEVERAGE* (-) as assets over equity, as this should negatively affect the financial forecasts of equity analysts. Barnett & Salomon (2012) point out that debt affects managerial behavior, such that debt imposes discipline and creates incentives for managers to make decisions in the best interest of the firm, but it can also limit opportunities for new business development and negatively affect profitability. Accounting data is lagged by one year to account for retrospective financial reports.

In addition to these market and accounting-based variables, we also monitor the number of analysts, *ANALYSTS* (+), following the firm during specific firm-years, as the amount of analyst attention has been shown to affect firm value (Zuckerman, 1999). For example, the authors of Zheng et al. (2022) show that higher analyst coverage of a company can lead to more public attention and scrutiny, making these companies more likely to disclose ESG data. *Table 4* provides definitions and data sources for the control variables.

[9] The predicted sign of the control variable is shown in parentheses.

Table 4. Variable definitions and data sources

Control variable	*Definition*	*Source*
MV_BV	Market-to-book value, calculated as the market value of total equity divided by the book value of common equity at the end of year *t*. [1]	Refinitiv Eikon
SIZE	The natural logarithm of a company's total market value of all outstanding shares in SEK at the end of year *t*.	Refinitiv Eikon
ROA	Indicator of how profitable a company is relative to its total assets, in percentage. It shows how efficiently management uses its assets to generate earnings. [1]	S&P Capital IQ
CAPEX_TA	Amount of fixed assets purchased during the fiscal period as a percentage of total assets.	S&P Capital IQ
INTANG_TA	The total amount of Intangible Assets as disclosed in the financial report as a percentage of Total Assets. Intangible assets include goodwill, patents, copyrights, trademarks, trade manes, organization costs, capitalized development costs and software, franchises, licenses, property rights, etc.	S&P Capital IQ
LEVERAGE	Financial leverage calculated as the measured as total assets divided by shareholder's equity.	Bloomberg
ANALYSTS	Number of analysts following a focal firm a focal year.	Refinitiv Eikon

All currencies are converted to SEK.
[1] *MV_BV*, *PE* and *ROA* have been winsorized at the 1th and 99th percentiles to mitigate the effect of extreme values.

5. Analysis and Results

The results are presented below in three sections. Descriptive statistics and correlations between all main variables are presented in section 5.1. In 5.2 and 5.3, we comment on the results for Hypothesis 1 and Hypothesis 2, respectively.

5.1 Descriptive Statistics

Table 5 shows the descriptive statistics of each variable used in our models. From the *SIZE* variable, we can see that our sample mainly consists of large firms (minimum market cap of ~2.4 bn SEK and maximum of ~588 bn SEK, with a mean of ~37 bn SEK). An average *UPSIDE* of 25% suggests that analysts are more positive than negative about the firms in our sample over the studied period, but there is a large variance. The average *MV_BV* for the firms in our sample is 2.74, indicating that the market value on average is larger than total book value. The minimum *MV_BV* in our sample of 0.18 presents a large span to the maximum value at 19.00. From the *INTANG_TA* variable, we see that the intangible assets represent on average 22% of total assets in our sample, and the average firm is profitable represented by the mean *ROA* of 5%. On average, firms in our sample invest the equivalent of 3% of total assets each year, expressed in the *CAPEX_TA* variable. Furthermore, the companies in our sample score highest on the *G_SCORE*, followed by the *E_SCORE* and finally the *S_SCORE*. Each ESG pillar and the overall *ESG_SCORE* have a wide range of scores from low to high on a scale of 0-100.

Table 6 Appendix 1 shows the Pearson correlation coefficients between the dependent and independent variables used in the regression models. We note that *ESG_SCORE* has a significant positive correlation (0.126) with the variable *UPSIDE*, which is consistent with our hypothesis. All ESG scores are positively and highly significantly correlated with each other. Consistent with the discussion in Section 4.5, all control variables have the expected correlation signs with *UPSIDE*, except for *SIZE*, which is significantly negatively correlated with *UPSIDE.* This suggests that analysts assign higher target prices to smaller companies relative to their stock price because they see greater growth potential in these companies. In addition, as expected, *SIZE* and *ANALYSTS* are positively and significantly correlated with *ESG_SCORE*, *E_SCORE, S_SCORE*, and *G_SCORE*. The strongest correlation between independent variables (0.350) is between *ANALYSTS* and *ESG_SCORE*, followed by (0.344) between *SIZE* and *ESG_SCORE*. A variance inflation factor (VIF) from the primary regression

shows that none of the variables have a VIF value greater than 10, indicating that there is no multicollinearity issue, so we can keep *SIZE* and *ANALYSTS* as a control variable.[10]

Table 5. Descriptive Statistics

Variables	Obs.	Mean.	Std. dev.	Min	Max
UPSIDE	750	0.25	0.70	-0.89	6.17
ESG_SCORE	750	40.98	10.43	13.51	67.43
E_SCORE	750	27.38	19.13	0	79.49
S_SCORE	750	22.05	10.04	0	52.36
G_SCORE	750	73.39	8.96	40.43	89.86
MV_BV	750	2.74	2.65	0.18	19.00
SIZE	750	24.34	1.28	19.37	29.05
ROA	750	0.05	0.05	-0.08	0.26
CAPEX_TA	750	0.03	0.04	0.00	0.40
INTANG_TA	750	0.22	0.21	0.00	0.86
LEVERAGE	750	3.56	4.13	1.06	25.93
ANALYSTS	750	13.87	9.32	1	42

This table presents descriptive statistics for all main variables for 750 firm-year observations between 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG_SCORE, E_SCORE, S_SCORE, and G_SCORE* are the Bloomberg ESG Disclosure Pillar Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the amount of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year.

5.2 Hypothesis 1

To investigate the first hypothesis, whether companies with high ESG performance have higher potential stock price gains than companies with low ESG performance, we regress the average potential upside estimates *UPSIDE* on *ESG_SCORE* and the control variables *MV_BV, SIZE, ROA*, *CAPEX_TA, INTANG_TA*, *LEVERAGE* and *ANALYSTS*. For this regression, we use the full sample of 750 firm-year observations. Due to heteroscedasticity identified in section 6.2.2, all regressions use robust standard errors. *Table 7* shows the OLS regression results with robust standard errors clustered at the firm level. In the baseline model (1), the coefficient on *ESG_SCORE* is positive (0.015). It is statistically significant at the 1% level, meaning that a one-point increase in *ESG_SCORE* leads to a 1.5 percentage point increase in potential stock price gains, holding all other variables constant. We consider the magnitude of the coefficient

[10] See Figure 2 for the VIF-test and further discussion in section 6.2.4 for the implication of multicollinearity.

to be economically significant. All control variables except *SIZE*, *CAPEX_TA* and *INTANG_TA* have the expected signs, consistent with previous literature, although *MV_BV* and *ROA* are not significant. The adjusted R^2, which indicates the goodness-of-fit of the statistical model, shows that 21% of the sample variation in stock price potential can be explained by the independent variables, which is consistent with previous work like Bolognesi & Burchi (2023).[11]

Table 7. Baseline regressions

Variables	Baseline model (1)	Firm-fixed effects, unbalanced panel (2)	Firm-fixed effects, balanced panel (3)
ESG_SCORE (+)	0.015***	0.020***	0.034***
	(0.005)	(0.006)	(0.009)
MV_BV (-)	-0.000	-0.000***	-0.031
	(0.000)	(0.000)	(0.022)
SIZE (+)	-0.185***	-0.314***	-0.413***
	(0.037)	(0.071)	(0.112)
ROA (+)	0.374	0.674	1.567***
	(0.328)	(0.516)	(0.529)
CAPEX_TA (+)	-2.745***	0.442	1.482
	(0.651)	(0.876)	(1.869)
INTANG_TA (+)	-0.202*	0.788	1.256*
	(0.112)	(0.544)	(0.759)
LEVERAGE (-)	-0.012***	-0.007***	-0.007
	(0.003)	(0.002)	(0.024)
ANALYSTS (+)	0.009***	0.033***	0.048***
	(0.003)	(0.010)	(0.013)
CONSTANT	4.451***	6.206***	7.580***
	(0.852)	(1.381)	(2.120)
Firm effects	No	Yes	Yes
Industry effects	Yes	No	No
Year effects	Yes	Yes	Yes
Observations	750	750	445
Adj. R^2	0.212	0.672	0.728
Firms	64	64	31

The table shows the results from an OLS regression of the potential stock price gains calculation on ESG scores and control variables across the years 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG_SCORE* is the Bloomberg ESG Disclosure Score, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. SIZE is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year. Firms are categorized by the Global Industry Classification Standard. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

[11] For example, Bolognesi & Burchi (2023) received an adjusted R^2 of 23.3% with a similar set of control variables.

Overall, the coefficient of *ESG_SCORE* is positive (0.015***, t-stat= 3.34), rejecting the null hypothesis at a 1% significance level. We conclude that companies with high ESG performance have higher upside potential compared to companies with low ESG performance.

Table 8. Fixed effects regression model for each ESG pillar

Variables	ESG (4)	E (5)	S (6)	G (7)
ESG_SCORE (+)	0.020*** (0.006)			
E_SCORE (+)		0.006*** (0.002)		
S_SCORE (+)			0.017*** (0.005)	
G_SCORE (+)				0.006** (0.003)
MV_BV (-)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000** (0.000)
SIZE (+)	-0.314*** (0.071)	-0.310*** (0.072)	-0.305*** (0.068)	-0.309*** (0.036)
ROA (+)	0.674 (0.516)	0.748 (0.531)	0.478 (0.484)	0.713 (0.518)
CAPEX_TA (+)	0.442 (0.876)	0.418 (0.870)	0.473 (0.903)	0.525 (0.875)
INTANG_TA (+)	0.788 (0.544)	0.778 (0.558)	0.813 (0.545)	0.779 (0.559)
LEVERAGE (-)	-0.007*** (0.002)	-0.008*** (0.003)	-0.006** (0.003)	-0.008*** (0.003)
ANALYSTS (+)	0.033*** (0.010)	0.035*** (0.011)	0.032*** (0.010)	0.038*** (0.011)
CONSTANT	6.206*** (1.381)	6.630*** (1.455)	6.530*** (1.401)	6.262*** (0.967)
Firm effects	Yes	Yes	Yes	Yes
Industry effects	No	No	No	No
Year effects	Yes	Yes	Yes	Yes
Observations	750	750	750	750
Adj. R^2	0.672	0.665	0.674	0.714
Firms	64	64	64	64

The table shows the results from an OLS regression of the potential upside calculation on ESG scores and control variables across the years 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG_SCORE, E_SCORE, S_SCORE,* and *G_SCORE* is the Bloomberg ESG Disclosure Pillar Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year. The models consist of all 750 firm-year observations. Firms are categorized by the Global Industry Classification Standard. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

Firm fixed effects are included in the second regression (2) to control for time-constant firm-specific factors, while industry fixed effects are omitted due to collinearity.[12] The use of firm fixed effects still shows a significant effect of *ESG_SCORE* on the dependent variable *UPSIDE* at a confidence level of 99%, while achieving an adjusted R^2 of 67.2%, resulting in a more robust model. Therefore, we can again reject the null hypothesis. The coefficients of the control variables have changed slightly: *CAPEX_TA* and *INTANG_TA* are no longer negative but positive, and *INTANG_TA* is now significantly positive in the balanced panel (3). A possible explanation for these changes in sign and significance in (2) could be that a firm-specific omitted variable affects the relationship between a stock's upside potential and the affected independent variables. For further discussion of omitted variables, see section 6.2.1.

Table 8 shows the empirical results of the test of the first hypothesis for the three individual ESG pillars and the overall ESG disclosure score. In each model, the ESG pillars have a significant and positive coefficient. These results indicate that ESG transparency in all the pillars is associated with a higher price target and therefore a higher upside potential, which supports our first hypothesis. *G_SCORE* is the least significant of the three columns in the regression on the dependent variable. *S_SCORE* shows the highest coefficient (0.017) of the three ESG columns on the dependent variable *UPSIDE*. Using a two-sided t-test we conclude that the environmental and corporate governance pillars have lower premiums (0.006) than the social pillar (0.017) at a 99% confidence level.

In summary, the results in *Table 7* and *Table 8* show that the relationship between ESG performance and stock price potential is statistically positive, and the likelihood of endogeneity problems in our models for hypothesis 1 is low.

5.3 Hypothesis 2

To test the second hypothesis, whether there is a time-varying effect of ESG performance on a stock's upside potential, we conduct two tests, shown in *Table 9* and *Table 10*. We first test the second hypothesis using a multiplicative interaction model in which *TIME* is an additive continuous variable that interacts with *ESG_SCORE*. We use this to find out whether the effect of increasing ESG score by one point decreases the stock’s potential upside over the years of the sample period. The regression results can be seen in *Table 9*, where the first column (8) contains industry fixed effects, and the second column (9) contains firm fixed effects.

[12] Some industries are only represented by one firm, see sample distribution in *Table 2*.

Table 9. The effect of ESG across the years 2008-2022

Variables	Baseline model (8)	Firm-fixed effects (9)
ESG_SCORE (+)	0.036***	0.027***
	(0.012)	(0.009)
TIME (+)	0.081**	0.016
	(0.034)	(0.021)
*TIME * ESG (-)*	-0.002**	-0.001
	(0.001)	(0.001)
MV_BV (-)	-0.000	-0.000**
	(0.000)	(0.000)
SIZE (+)	-0.180***	-0.331***
	(0.035)	(0.064)
ROA (+)	0.345	0.747
	(0.334)	(0.499)
CAPEX_TA (+)	-2.723***	0.594
	(0.664)	(0.903)
INTANG_TA (+)	-0.180	0.761**
	(0.116)	(0.521)
LEVERAGE (-)	-0.011***	-0.007
	(0.003)	(0.002)
ANALYSTS (+)	0.007*	0.027***
	(0.004)	(0.009)
CONSTANT	3.420***	6.387***
	(0.798)	(1.263)
Firm effects	No	Yes
Industry effects	Yes	No
Year effects	No	No
Observations	750	750
Adj. R^2	0.222	0.667
Firms	64	64

The table shows the results from OLS regressions of the potential upside calculation on ESG scores and control variables. The sample consist of 750 firm-year observations over the period of 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *TIME* represent every year our regression sample, with 1 indicating year 2009 etc. *ESG SCORE* is the Bloomberg ESG Disclosure Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the capital expenditure during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. LEVERAGE is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm during a focal year. Firms are categorized by the Global Industry Classification Standard. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

As can be seen in *Table 9*, the interaction variable *TIME * ESG* is negative in both regression models, but significant only in model (8), implying that the effect of an increase in *ESG_SCORE* is interpreted as having a decreasing effect on a stock's upside potential over the years of the sample period. The first regression (8) explains 22.2% of the observed values of potential upside and the second regression model (9) explains 66.7%.

Instead of controlling for year fixed effects in hypothesis 2, a time variable (*TIME*) is included. This variable is significant in the model that includes industry fixed effects (8) but not in the model with firm fixed effects (9). The variable *TIME* shows how the increasing linear effect changes with time from the base year 2008. In the industry fixed effects model (8), an average increase of one year over previous years increases the upside potential of the stock by 8.1%, holding everything else constant. The corresponding figure for firm fixed effects is 1.6%. However, the time variable should be interpreted with caution, as the effect over 15 years rarely shows a linear and constant increase in upside potential, as the economy and industries are constantly exposed to economic effects and shocks.

Table 10. Changes over time

Variables	2008-2010 (10)	2008-2013 (11)	2008-2016 (12)	2008-2019 (13)	2008-2022 (14)
ESG_SCORE (+)	0.062***	0.034***	0.025***	0.020***	0.015***
	(0.012)	(0.008)	(0.006)	(0.005)	(0.005)
MV_BV (-)	0.056	-0.005	-0.000	-0.001	-0.000
	(0.034)	(0.013)	(0.001)	(0.000)	(0.000)
SIZE (+)	-0.313**	-0.279***	-0.228***	-0.194***	-0.185***
	(0.132)	(0.074)	(0.052)	(0.041)	(0.037)
ROA (+)	0.569	0.863	1.034	0.411	0.374
	(1.205)	(0.899)	(0.699)	(0.562)	(0.328)
CAPEX_TA (+)	-5.874**	-5.136***	-3.567**	-3.214***	-2.745***
	(2.610)	(1.911)	(1.413)	(1.165)	(0.651)
INTANG_TA (+)	-0.230	-0.297	0.395*	-0.270	-0.202*
	(0.532)	(0.320)	(0.237)	(0.190)	(0.112)
LEVERAGE (-)	-0.015	-0.015	-0.016**	-0.014**	-0.012***
	(0.010)	(0.010)	(0.008)	(0.007)	(0.003)
ANALYSTS (+)	0.014	0.014	0.012***	0.010	0.009***
	(0.010)	(0.010)	(0.007)	(0.006)	(0.003)
CONSTANT	6.383**	6.414***	5.389***	4.623***	4.451***
	(3.054)	(1.680)	(1.174)	(0.940)	(0.852)
Firm effects	No	No	No	No	No
Industry effects	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes
Observations	123	274	435	567	750
Adj. R^2	0.346	0.285	0.247	0.206	0.212
Firms	44	51	57	58	64

The table shows the results from OLS regressions of the potential upside calculation on ESG scores and control variables across five time periods. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG SCORE* is the Bloomberg ESG Disclosure Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the capital expenditure during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm during a focal year. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

Table 11. The effect of ESG across the years 2008-2022 for each ESG pillar

Variables	ESG (15)	E (16)	S (17)	G (18)
SCORE (+)	0.036***	0.012**	0.043***	0.014*
	(0.012)	(0.005)	(0.012)	(0.007)
TIME (+)	0.081**	0.018*	0.030**	0.115**
	(0.034)	(0.010)	(0.014)	(0.050)
*TIME * SCORE (+)*	-0.002**	-0.001*	-0.003***	-0.002**
	(0.001)	(0.000)	(0.001)	(0.001)
MV_BV (-)	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
SIZE (+)	-0.180***	-0.186***	-0.171***	-0.192***
	(0.035)	(0.035)	(0.034)	(0.037)
ROA (+)	0.345	0.374	0.149	0.337*
	(0.334)	(0.338)	(0.357)	(0.337)
CAPEX_TA (+)	-2.723***	-2.701***	-2.885***	-2.354**
	(0.664)	(0.673)	(0.696)	(0.621)
INTANG_TA (+)	-0.180	-0.216*	-0.078	-0.276*
	(0.116)	(0.115)	(0.113)	(0.116)
LEVERAGE (-)	-0.011***	-0.011***	-0.011**	-0.011**
	(0.003)	(0.003)	(0.003)	(0.003)
ANALYSTS (+)	0.007*	0.012***	0.003	0.017***
	(0.004)	(0.004)	(0.004)	(0.004)
CONSTANT	3.420***	4.440***	3.842***	3.680***
	(0.798)	(0.811)	(0.767)	(0.906)
Firm effects	No	No	No	No
Industry effects	Yes	Yes	Yes	Yes
Year effects	No	No	No	No
Observations	750	750	750	750
Adj. R^2	0.222	0.198	0.253	0.188
Firms	64	64	64	64

The table shows the results from OLS regressions of the potential upside calculation on ESG scores and control variables. The sample consist of 750 firm-year observations over the period of 2008-2022. UPSIDE is the stock's potential upside for each firm for a focal year. *TIME* represent every year our regression sample, with 1 indicating year 2009 etc. ESG SCORE pillar is the Bloomberg ESG Disclosure Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. MV_BV is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. ROA is the return on assets. CAPEX_TA is the capital expenditure during the fiscal period as a percentage of total assets. INTANG_TA is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. LEVERAGE is the firm's financial leverage defined as the average assets to average equity. ANALYSTS is the number of analysts following a focal firm during a focal year. Firms are categorized by the Global Industry Classification Standard. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

Table 10 extends the results from *Table 9*, with the first column showing the estimates of the baseline model for the first three years of our sample (10), which includes observations for 2008-2010; each subsequent column adds another three years to the dataset (i.e., the second column estimates the model for 2008-2013; the third for 2008-2016; and so on). Accordingly, the last column contains the estimation results for the baseline regression model with complete

data covering the entire 2008-2022 period in our sample. We estimate the model for these different bundles of years to determine how the relationship changes over time. Consistent with the results in *Table 9*, *Table 10* shows the estimated coefficients for *ESG_SCORE* and illustrates that the ESG performance premium in the upside potential of a stock becomes less favorable over time. With a two-sided t-test we confirm a statistical difference between the results of the first-period regression and the full-sample regression at a 99% confidence level. It is important to note that the number of individual firms, and hence the number of observations in the columns of *Table 10*, increases as Bloomberg gradually expanded its coverage over our sample period.

We find that the positive effect of ESG performance on a stock's upside potential is strongest in the first block of 2008-2010, suggesting that investors valued ESG more during and after the 2008 financial crisis. For example, Lins et al. (2017) found that companies with better sustainability performance had higher stock returns than those with low sustainability performance during the 2008-2009 financial crisis. The companies with high sustainability performance also had higher profitability, growth, and revenue per employee. This shows that the trust built between a company and its stakeholders and investors through investment in sustainability activities pays off when the overall level of trust in companies and markets suffers from a negative shock. On the other hand, the strong results during this period could also potentially be due to the short sample period with few observations, confounding variables and/or possible survivorship bias. Thus, the results of the regressions with a smaller sample size should be interpreted with caution.

The negative relationship between ESG performance and potential stock price gains over time is also evident when the *ESG_SCORE* is broken down into environmental (16), social (17) and corporate governance (18) dimensions, with all three dimensions significant at the 10% significance level. Confirming a statistical difference using a two-sided t-test we conclude at a 95% confidence level that the highest decrease in ESG score for upside potential over time is found for the social pillar (-0.003***) and the lowest for the environmental pillar (-0.001*). With an additional two-sided t-test we confirm with a 95% confidence level that there is a significant difference between the environmental and governance pillar too. This result suggests that environmental performance is not being priced in the financial market at the same rate as social and governance performance.

The results in *Table 10* and *Table 11* stand in contrast to Ioannou & Serafeim (2015) who find an increasing relevance effect of ESG scores on equity analyst investment recommendations during 1993-2007, shifting from negatively to positively correlated, whereas

we simply see a decreasing positive effect. Although their results are not directly comparable as they have another measurement methodology and differing control variables, there might be several other reasons for the discrepancy. It is worth noting that their measurement methodology means market perceptions are not captured to the same extent in their model, as they use recommendations rather than target prices. This could mean that shifting investor preferences are not captured to the same extent as shifting analyst opinions. The differences in time periods and geographical areas of focus could also drive divergence of results. For instance, their time frame shows shifting analyst sentiments, whereas our sample period could be capturing shifting investor sentiments. The general market sentiment concerning ESG might also have started shifting earlier in Sweden than the US, accounting for the different trends. Such potential differences between the US and Nordic markets could be an interesting avenue for future research.

Based on the results of the regressions in *Table 9, Table 10*, and *Table 11*, we can reject the null hypothesis at a 5% significance level and accept the alternative hypothesis that the potential upside of stocks due to improved ESG performance decreases over time.

6. Sensitivity and Discussion

In this section, we discuss the sensitivity of decisions and assumptions that may affect our results. In the sensitivity analysis in Section 6.1, we discuss the variables used in our regression model. In the next section, 6.2, we present robustness tests to check the validity of the assumptions required for the chosen estimation model.

6.1 Sensitivity analysis and reliability of assumptions

6.1.1 Analysts' target prices versus recommendations

In addition to the stock's potential upside, we test our first hypothesis using a second dependent variable: consensus (mean) investment recommendation. The variable *UPSIDE* is replaced by our new variable, which we call *MEANREC* in the baseline regression model (1). Consistent with previous research, we select the March dataset each year to ensure analysts have sufficient time to obtain and analyze firm-level ESG disclosure (Ioannou & Serafeim, 2015). To determine the consensus recommendation, I/B/E/S first collects all published analyst recommendations (in our case, in March) and then takes an equally weighted average. Consequently, each year, our dependent variable for a given company is the average of all investment recommendations. In the I/B/E/S database, analysts' investment recommendations are recorded on a five-point scale, where one indicates a strong buy recommendation, and five indicates a strong sell recommendation. When we construct the variable, the scores are reversed so that higher recommendations take on larger values, meaning that 1 is a strong sell recommendation and 5 is a strong buy recommendation in our dataset.

Most importantly, in *Table 12*, we see that *ESG_SCORE* significantly impacts the *UPSIDE* variable, while it has an insignificant effect on *MEANREC*. However, the coefficient of *ESG_SCORE* is positive for both *UPSIDE* and *MEANREC*. On the one hand, the significant difference is surprising since recommendations are essentially based on target prices, even if they are considered more long-term and general. Target prices are dynamic and are changed when new information affects the company's valuation, giving a more detailed picture of the analysis. Assuming that the changes in ESG scores are of a smaller magnitude or that the ESG score is only a tiny part of the valuation, it could mean that it only has a negligible impact on the target price rather than changing the entire recommendation. On the other hand, this could support that confounding variables are driving results in target prices. For a discussion of other potential control variables to mitigate this, see 6.1.3 *Control variables*.

Table 12. Different types of analyst valuations

Variables	*UPSIDE* (19)	*MEANREC* (20)
ESG_SCORE (+)	0.015***	0.003
	(0.005)	(0.003)
MV_BV (-)	-0.000	0.001*
	(0.000)	(0.000)
SIZE (+)	-0.185***	-0.063***
	(0.037)	(0.022)
ROA (+)	0.374	0.111
	(0.328)	(0.393)
CAPEX_TA (+)	-2.745***	-3.034***
	(0.651)	(0.662)
INTANG_TA (+)	-0.202*	0.220**
	(0.112)	(0.109)
LEVERAGE (-)	-0.012***	0.000
	(0.003)	(0.003)
ANALYSTS (+)	0.009***	-0.010***
	(0.003)	(0.003)
CONSTANT	4.451***	2.209***
	(0.852)	(0.510)
Firm effects	No	No
Industry effects	Yes	Yes
Year effects	Yes	Yes
Observations	750	750
Adj. R^2	0.212	0.138
Firms	64	64

The table shows the results from an OLS regression of the potential stock price gains calculation on ESG scores and control variables across the years 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *MEANREC* is the analyst consensus recommendation for each firm a focal year. *ESG_SCORE* is the Bloomberg ESG Disclosure Score, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. SIZE is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year. Firms are categorized by the Global Industry Classification Standard. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

6.1.2 Measuring ESG

We recognize that ESG performance is difficult to measure since sustainability reporting is voluntary and not standardized to the same extent as financial information in annual reports. For instance, Berg et al. (2022) show that there are significant inconsistencies between different ESG score providers that could affect results when such scores are used as proxies in research. They suggest that this is mainly due to differences in the measurement and scope of the scores. In *Table 13*, we therefore compare the results of using the Bloomberg ESG Disclosure Score and the Refinitiv Eikon ESG Score – the two score providers we have access to. The

ESG_SCORE variable is significant when using both sources, although the coefficient is different. Using a two-sided t-test, we can see a significant difference between the *ESG_SCORE* coefficient for the two scores at a 95% confidence level. This could for example be due to the fact that there are fewer observations in the Eikon dataset, discrepancies in scores, or differences in timing. Fewer observations of the same firms in the dataset suggest that some firms were covered by Refinitiv Eikon ESG over a shorter period, which may affect the results. We believe the fact that both vendors achieve significant effects adds to the robustness of our results, as it is not just the specific score used that drive our results.

Table 13. Variations of ESG proxy

Variables	Bloomberg ESG Score (21)	Refinitiv Eikon ESG Score (22)
ESG_SCORE (+)	0.015***	0.006***
	(0.005)	(0.002)
MV_BV (-)	-0.000	0.000
	(0.000)	(0.000)
SIZE (+)	-0.185***	-0.178***
	(0.037)	(0.039)
ROA (+)	0.374	0.453
	(0.328)	(0.328)
CAPEX_TA (+)	-2.745***	-2.736***
	(0.651)	(0.736)
INTANG_TA (+)	-0.202*	-0.178
	(0.112)	(0.121)
LEVERAGE (-)	-0.012***	-0.012***
	(0.003)	(0.003)
ANALYSTS (+)	0.009***	0.009**
	(0.003)	(0.004)
CONSTANT	4.451***	4.379***
	(0.852)	(0.914)
Firm effects	No	No
Industry effects	Yes	Yes
Year effects	Yes	Yes
Observations	750	688
Adj. R^2	0.212	0.207
Firms	64	64

The table shows the results from an OLS regression of the potential upside calculation on ESG scores and control variables across the years 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG SCORE* is the corresponding ESG Disclosure Score, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year. Firms are categorized by the Global Industry Classification Standard. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

6.1.3 Sample and model specification

Control variables

Ioannou & Serafeim (2015) use the control variable *mean house size*, which indicates the average number of employees in brokerage firms that employ an analyst for a given firm and serves as a proxy for the resources available to analysts. However, we could not collect sufficient data on this variable and therefore excluded it from our regressions.

Media attention or public perception of ESG activities might have been a relevant control variable to include, as ESG would reasonably be a larger part of the valuation in firms where it is a larger part of their business or brand. We find this to be difficult to measure objectively but it could be interesting to analyze in future research.

The *liquidity* of a focal firm could be argued to be relevant as a control variable, as a firm with more liquid resources can utilize these for improving ESG activities, whereas a firm with less liquidity might find it more difficult to motivate such spending. No previous literature within this research space has utilized this control variable, and we argue that this to some extent should be captured by *SIZE*. However, it could be interesting to see if this influences ESG activities in future research.

Some earlier literature, like Ioannou & Serafeim (2015) as well as Bolognesi & Burchi (2023), utilize both market-to-book value (*MV_BV*) and price-to-earnings ratio (*PE*) as control variables. In *Table 15* of Appendix 2 we run our baseline model (27) and the firm fixed effect model (28) for hypothesis 1 including *PE* as a control variable. Using a two-sided t-test to compare the *ESG_SCORE* coefficient with and without *PE* as a control variable, we see that there is not a significant difference at a 95% confidence level. As the *MV_BV* and *PE* variables have some clear similarities, we argue that they measure approximately the same thing and including *PE* in our model is therefore not beneficial.

Excluding financial, utilities, and health care sectors

Following Awaysheh et al. (2020) and Bolognesi & Burchi (2023), we exclude firms that belong to the financial and utilities sectors in model (23) through (26). This is because these sectors are highly regulated, have a different capital structure, and are highly leveraged. We argue that this also is applicable to the health care sector, and thus also exclude those firms in these models. The regression results in *Table 14* confirm hypothesis 1, and our results remain unchanged.

Table 14. Subsample of industries: Excluding financial, utilities, and health care sectors

Variables	ESG (23)	E (24)	S (25)	G (26)
PILLAR_SCORE (+)	0.020**	0.005**	0.020**	0.007**
	(0.007)	(0.002)	(0.007)	(0.004)
MV_BV (-)	-0.001	-0.002	-0.001	-0.003
	(0.004)	(0.004)	(0.004)	(0.003)
SIZE (+)	-0.357***	-0.355***	-0.346***	-0.360***
	(0.088)	(0.089)	(0.084)	(0.089)
ROA (+)	1.357	1.592	1.125	1.573
	(0.991)	(1.029)	(0.939)	(1.014)
CAPEX_TA (+)	0.972	0.989	0.920	1.244
	(1.073)	(1.078)	(1.121)	(1.068)
INTANG_TA (+)	0.915	0.961	0.932	0.966
	(0.606)	(0.632)	(0.602)	(0.632)
LEVERAGE (-)	-0.007***	-0.008***	-0.007**	-0.008***
	(0.003)	(0.003)	(0.003)	(0.003)
ANALYSTS (+)	0.041***	0.045***	0.041**	0.048***
	(0.012)	(0.013)	(0.012)	(0.014)
CONSTANT	6.916***	7.387***	7.159***	7.050***
	(1.746)	(1.829)	(1.737)	(1.810)
Firm effects	Yes	Yes	Yes	Yes
Industry effects	No	No	No	No
Year effects	Yes	Yes	Yes	Yes
Observations	599	599	599	599
Adj. R^2	0.679	0.671	0.683	0.671
Firms	51	51	51	51

The table shows the results from OLS regressions of the potential upside calculation on ESG scores and control variables across the years 2008-2022. This robustness analysis reports the estimate of the coefficients excluding companies operating in the finance and utilities sectors from the sample. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG SCORE, E SCORE, S SCORE*, and *G SCORE* are the Bloomberg ESG Disclosure Pillar Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

Sample bias

We note that many companies were excluded due to the constraints imposed by our dependent variable *UPSIDE* and the independent variable *ESG_SCORE*, leaving us with an unrepresentative sample of the population. The companies in our sample are more likely to be relatively large companies that are followed by more analysts and publish a larger amount of ESG information. For instance, larger firms might have more resources to deploy on ESG activities. However, *SIZE* is already included in the regression model. Companies not in our sample are likely to be smaller, younger, and not covered by analysts.

Furthermore, as our sample consists of currently listed firms, our data, and sample will have an inherent survivorship bias. This is because companies that have gone bankrupt, been delisted, and so on are omitted; thus, those that "fail" are not represented. This means that only the firms that have survived during our sample period will be included, which, combined with our harsh screening of requiring both analyst coverage and ESG disclosure scores, limits our sample and might affect the conclusions that can be drawn from our results.

6.2 Robustness tests

To check the robustness of our results we perform the following tests:

6.2.1 Serial correlation

First, we aim to verify the lack of any endogeneity problems due to omitted variables, simultaneity, or unobserved specific effects. Although the year-fixed effects model goes a long way in addressing year-specific events, there is still a possibility that the error term is correlated within firms across time (Greene, 2000). Such serial correlation of residuals across observations within firms may lead to spurious regression results. Following earlier research (Azmi et al., 2021; Bilgin et al., 2021; Bolognesi & Burchi, 2023), we apply the System Generalized Method of Moments (GMM) estimator developed by Blundell & Bond (1998) and Arellano & Bover (1995), which is one way to control for endogeneity problems. By incorporating a one-year lag of the dependent variable into the firm-fixed effects model (2) we account for within-firm persistence in performance.

Table 16 in Appendix 3 reports the coefficient estimates of the two-phase System GMM model for each ESG disclosure pillar score, respectively. The coefficient *ESG_SCORE* is still significantly positive (0.013**) as in the firm-fixed effects model (2), confirming our first hypothesis.

6.2.2 Heteroskedasticity

Second, the OLS regression method assumes that the error terms are homoscedastic (equal variance) across all observations. If this is not the case, we have the problem of heteroscedasticity (unequal variance) of the error term. Heteroscedasticity typically occurs with cross-sectional data, that is, time series data such as the panel data used in this thesis. When heteroscedasticity is present, OLS estimators are still unbiased and consistent, but no longer efficient. There is a loss of efficiency because the standard errors and confidence intervals become too narrow and give a false sense of precision. As a result, the *t* and *F* tests may not be

reliable (Wooldridge, 2012). We perform a Breusch-Pagan-Cook-Weisberg F-statistic and Chi-square test with the null hypothesis that the residuals are distributed with equal variance (homoscedasticity) against the alternative hypothesis that the residuals are not distributed with equal variance (heteroscedasticity). If the p-value of the test is below the 1% significance level, we reject the null hypothesis and conclude that we have heteroscedasticity in the regression model.

With an F-value of 4.21 and p=0.0000, we reject the null hypothesis and conclude that we have significant heteroscedasticity. Using the Lagrange multiplier option, we construct the LM test statistic (Breusch & Pagan, 1980). The test yields a value of 1,290.00 and p=0.0000, confirming a heteroskedasticity problem in our model. To correct for heteroskedasticity, we use robust standard errors in our regressions. See *Figure 1* in Appendix 3 for a scatter plot of the residuals.

6.2.3 Multicollinearity

Finally, we test whether there is a multicollinearity problem in our model. If one of the predictor variables in a multiple regression is well predicted by another predictor variable or a combination of other predictor variables, they are said to be multicollinear. High multicollinearity results in a poorly estimated coefficient and a substantial standard error (and a corresponding low t-statistic and high p-value). Consequently, the effect of each variable cannot be separated, and the regression equation becomes unstable. Since our regression model measures the effect of the independent variable on the dependent variable, multicollinearity cannot exist. If multicollinearity exists between the variables, note that the regression coefficients can no longer be meaningfully interpreted. However, prediction with the regression model is still possible.

Table 6 in Appendix 1 shows Pearson correlation coefficients between variables, finding a correlation of 0.344 between *SIZE* and *ESG_SCORE*. A multicollinearity diagnosis is performed using a VIF test to find out if multicollinearity is present in our model. A VIF factor measures the strength of correlation between the independent variables in the regression analysis. In the baseline regression, we find that the VIF values are less than 10, which is usually considered to be the cut-off value (Wooldridge, 2012). Therefore, we conclude that there is no multicollinearity in our model and can keep *SIZE* as a control variable. The VIF results can be found in *Figure 2* in Appendix 3.

7. Conclusion

This study examines the relevance of ESG disclosure efforts by publicly traded Swedish companies to sell-side analysts' optimism about their stock market performance. We hypothesize that higher ESG performance leads to higher target prices and thus higher potential stock price gains. Moreover, we argue that the potential increase in a stock's value from improved ESG performance decreases over time due to the institutionalization of ESG disclosure. More specifically, ESG information is increasingly priced into the market, thereby increasing firm value and decreasing the potential upside of a stock specifically attributable to improved ESG performance.

Our main finding is that when we focus on the full observation period (2008-2022), we find a positive impact of ESG disclosure scores on firm valuation after controlling for variables traditionally used to explain firm-level financial performance. This result suggests that financial analysts recognize a premium for companies that are more committed to ESG transparency, which is consistent with both theory and previous research outside the Swedish context (Bolognesi & Burchi, 2023; Ioannou & Serafeim, 2015). We further investigate the relationship by introducing firm fixed effects to account for endogeneity problems. The results confirm that a positive effect of ESG performance on a stock's potential price gains can be established. Our results hold even when we consider alternative model specifications. Examining each ESG pillar separately, we find evidence that this positive relationship is mainly driven by social transparency, which has a higher coefficient than the environmental and governance pillars.

Furthermore, we find a diminishing effect of ESG performance on the potential upside of a stock over time. Thus, investors will experience lower abnormal returns from information specifically attributable to ESG disclosure, as ESG performance will be priced in the market. This is consistent with the efficient market hypothesis, where stock prices begin to reflect the true value of companies when more information about companies' ESG performance becomes available. The results of this paper also support the institutional perspective, which focuses on how financial markets perceive and value ESG information. The negative relationship between ESG performance and potential stock price gains over time is also evident when ESG is broken down into the environmental, social, and corporate governance pillars. We conclude that the highest decrease in ESG score for upside potential over time is found for the social pillar and the lowest for the environmental pillar. This result suggests that environmental performance is not being priced in the financial market at the same rate as social performance.

To conclude, we believe that our thesis both confirms and complements previous research on analysts' perceptions and evaluations of ESG information. Based on the ESG premium identified in target prices, it really does seem that the Swedish equity analyst just is an ESG salesperson for now. However, the market is catching up as ESG becomes increasingly incorporated in investors' valuations of companies.

7.1 Suggestions for further research

In 2020, a new taxonomy for environmental sustainability was introduced by the European Union (*EU taxonomy for sustainable activities.* 2023). Thus, it might be interesting to observe the impact of new government standards, such as the EU taxonomy, on this area of research by extending this thesis and analyzing the impact of ESG activities on European companies in the future. Applying our methodology to a Europe-wide context would also be interesting, to distinguish from the multitude of US-centric previous studies, as it would reveal potential differences in institutional contexts geographically and culturally, especially in terms of perceptions of ESG. It would also be interesting to examine this in comparison between the Nordics and the US. In addition, comparing results using multiple ESG score providers and determining if there is a difference in results due to discrepancies in these data sources would broaden the scope of this work and contribute to the literature on the effectiveness of ESG score providers. To focus more on simply the effect of ESG, this study could also be expanded to use a similar methodology as Ioannou & Serafeim (2015), utilizing market-adjusted returns as a control variable, but rather focusing on target prices instead of recommendations. As mentioned earlier, the inclusion of additional and different control variables, such as liquidity and the relevance of public perception, would also expand the scope of this work. Finally, it would be interesting to replicate this thesis in the future to capture further changes in the institutional context over time.

References

Adhikari, B. K. (2016). Causal effect of analyst following on corporate social responsibility. *Journal of Corporate Finance (Amsterdam, Netherlands), 41*, 201-216. https://doi.org/10.1016/j.jcorpfin.2016.08.010

Aguinis, H., & Glavas, A. (2012). What We Know and Don't Know About Corporate Social Responsibility: A Review and Research Agenda. *Journal of Management, 38*(4), 932-968. https://doi.org/10.1177/0149206311436079

Albinger, H. S., & Freeman, S. J. (2000). Corporate Social Performance and Attractiveness as an Employer to Different Job Seeking Populations. *Journal of Business Ethics, 28*(3), 243-253. https://doi.org/10.1023/A:1006289817941

Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *Management Science, 65*(10), 4451-4469. https://doi.org/10.1287/mnsc.2018.3043

Alsayegh, M. F., Abdul Rahman, R., & Homayoun, S. (2020). Corporate Economic, Environmental, and Social Sustainability Performance Transformation through ESG Disclosure. *Sustainability, 12*(9)https://doi.org/10.3390/su12093910

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29-51. https://doi.org/10.1016/0304-4076(94)01642-D

Awaysheh, A., Heron, R. A., Perry, T., & Wilson, J. I. (2020). On the relation between corporate social responsibility and financial performance. *Strategic Management Journal, 41*(6), 965-987. https://doi.org/10.1002/smj.3122

Azmi, W., Hassan, M. K., Houston, R., & Karim, M. S. (2021). ESG activities and banking performance: International evidence from emerging economies. *Journal of International Financial Markets, Institutions and Money, 70*, 101277. https://doi.org/10.1016/j.intfin.2020.101277

Baldini, M., Maso, L. D., Liberatore, G., Mazzi, F., & Terzani, S. (2018). Role of Country- and Firm-Level Determinants in Environmental, Social, and Governance Disclosure. *Journal of Business Ethics, 150*(1), 79-98. https://doi.org/10.1007/s10551-016-3139-1

Barber, B., Lehavy, R., McNichols, M., & Trueman, B. (2001). Can Investors Profit from the Prophets? Security Analyst Recommendations and Stock Returns. *The Journal of Finance, 56*(2), 531-563. http://www.jstor.org/stable/222573

Barnett, M. L., & Salomon, R. M. (2012). Does it pay to be really good? addressing the shape of the relationship between social and financial performance. *Strategic Management Journal, 33*(11), 1304-1320. https://doi.org/10.1002/smj.1980

Bartlett, A., & Preston, D. (2000). Can Ethical Behaviour Really Exist in Business? *Journal of Business Ethics, 23*(2), 199-209. https://doi.org/10.1023/A:1006037107565

Bénabou, R., & Tirole, J. (2010). Individual and Corporate Social Responsibility. *Economica (London), 77*(305), 1-19. https://doi.org/10.1111/j.1468-0335.2009.00843.x

Berg, F., Kölbel, J.,F., & Rigobon, R. (2022). Aggregate Confusion: The Divergence of ESG Ratings*. *Review of Finance, 26*(6), 1315-1344. https://doi.org/10.1093/rof/rfac033

Berman, S. L., Wicks, A. C., Kotha, S., & Jones, T. M. (1999). Does Stakeholder Orientation Matter? The Relationship between Stakeholder Management Models and Firm Financial Performance. *Academy of Management Journal, 42*(5), 488-506. https://doi.org/10.2307/256972

Bernardi, C., & Stark, A. W. (2018). Environmental, social and governance disclosure, integrated reporting, and the accuracy of analyst forecasts. *The British Accounting Review, 50*(1), 16-31. https://doi.org/10.1016/j.bar.2016.10.001

Bilgin, M. H., Danisman, G. O., Demir, E., & Tarazi, A. (2021). Bank credit in uncertain times: Islamic vs. conventional banks. *Finance Research Letters, 39*, 101563. https://doi.org/10.1016/j.frl.2020.101563

Billio, M., Costola, M., Hristova, I., Latino, C., & Pelizzon, L. (2021). Inside the ESG ratings: (Dis)agreement and performance. *Corporate Social-Responsibility and Environmental Management, 28*(5), 1426-1445. https://doi.org/10.1002/csr.2177

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143. https://doi.org/10.1016/S0304-4076(98)00009-8

Bolognesi, E., & Burchi, A. (2023). The impact of the ESG disclosure on sell-side analysts' target prices: The new era post Paris agreements. *Research in International Business and Finance, 64*https://doi.org/10.1016/j.ribaf.2022.101827

Brammer, S., Jackson, G., & Matten, D. (2012). Corporate Social Responsibility and institutional theory: new perspectives on private governance. *Socio-Economic Review, 10*(1), 3-28. https://doi.org/10.1093/ser/mwr030

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *The Review of Economic Studies, 47*(1), 239-253. https://doi.org/10.2307/2297111

Cheng, B., Ioannou, I., & Serafeim, G. (2014). Corporate social responsibility and access to finance. *Strategic Management Journal, 35*(1), 1-23. https://doi.org/10.1002/smj.2131

Chung, K. H. (2000). Marketing of Stocks by Brokerage Firms: The Role of Financial Analysts. *Financial Management, 29*(2), 35-54. https://doi.org/10.2307/3666284

Deegan, C. (2004). Environmental Disclosures and Share Prices – A Discussion About Efforts to Study This Relationship. *Accounting Forum - Account Forum, 28*, 87-97. https://doi.org/10.1016/j.accfor.2004.04.007

Deegan, C. (2009). *Financial Accounting Theory*. McGraw-Hill.

Derwall, J., Koedijk, K., & Ter Horst, J. (2011). A tale of values-driven and profit-seeking social investors. *Journal of Banking & Finance, 35*(8), 2137-2147. https://doi.org/10.1016/j.jbankfin.2011.01.009

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review, 86*(1), 59-100. https://doi.org/10.2308/accr.00000005

Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., & Yang, Y. G. (2012). Nonfinancial Disclosure and Analyst Forecast Accuracy: International Evidence on Corporate Social Responsibility Disclosure. *The Accounting Review, 87*(3), 723-759. http://www.jstor.org/stable/23245628

Dowling, J., & Pfeffer, J. (1975). Organizational Legitimacy: Social Values and Organizational Behavior. *The Pacific Sociological Review, 18*(1), 122-136. https://doi.org/10.2307/1388226

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science, 60*(11), 2835-2857. https://doi.org/10.1287/mnsc.2014.1984

Eccles, R. G., Serafeim, G., & Krzus, M. P. (2011). Market Interest in Nonfinancial Information. *Journal of Applied Corporate Finance, 23*(4), 113-127. https://doi.org/10.1111/j.1745-6622.2011.00357.x

El Ghoul, S., Guedhami, O., Kwok, C. C. Y., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance, 35*(9), 2388-2406. https://doi.org/10.1016/j.jbankfin.2011.02.007

ESG Data. (2023). Bloomberg Professional Services. https://www.bloomberg.com/professional/product/esg-data/

EU taxonomy for sustainable activities. (2023). European Commission – Finance. Retrieved May 13, 2023, from https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en

Fatemi, A., Glaum, M., & Kaiser, S. (2018). ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal, 38*, 45-64. https://doi.org/10.1016/j.gfj.2017.03.001

Ferrell, A., Liang, H., & Renneboog, L. (2016). Socially responsible firms. *Journal of Financial Economics, 122*(3), 585-606. https://doi.org/10.1016/j.jfineco.2015.12.003

Fisman, R., Heal, G., & Nair, V. (2005). *A model of corporate philanthropy*. Working Paper Columbia University and University of Pennsylvania.

Freeman, R. E. (1984). *Strategic management*. Pitman Publishing.

Fried, D., & Givoly, D. (1982). Financial analysts' forecasts of earnings: A better surrogate for market expectations. *Journal of Accounting & Economics, 4*(2), 85-107. https://doi.org/10.1016/0165-4101(82)90015-5

Friedman, M. (1970). The social responsibility of business is to increase its profits. *New York Times Magazine,* , 122-126.

Godfrey, P. C. (2005). The Relationship between Corporate Philanthropy and Shareholder Wealth: A Risk Management Perspective. *The Academy of Management Review, 30*(4), 777-798. https://doi.org/10.5465/AMR.2005.18378878

Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: an empirical test of the risk management hypothesis. *Strategic Management Journal, 30*(4), 425-445. https://doi.org/10.1002/smj.750

Graves, S. B., & Waddock, S. A. (1994). Institutional Owners and Corporate Social Performance. *Amj, 37*(4), 1034-1046. https://doi.org/10.5465/256611

Greene, W. H. (2000). *Econometric analysis* (4.th ed.)

Hainmueller, J., Mummolo, J., & Xu, Y. (2019). How Much Should We Trust Estimates from Multiplicative Interaction Models? Simple Tools to Improve Empirical Practice. *Political Analysis, 27*(2), 163-192. https://doi.org/10.1017/pan.2018.46

Henisz, W., Koller, T., & Nuttall, R. (2019). *Five ways that ESG creates value.* ().McKinsey. https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/five-ways-that-esg-creates-value

Hillman, A. J., & Keim, G. D. (2001). Shareholder value, stakeholder management, and social issues: what's the bottom line? *Strategic Management Journal, 22*(2), 125-139. https://doi.org/https://doi.org/10.1002/1097-0266(200101)22:23.0.CO;2-H

Hinze, A., & Sump, F. (2019). Corporate social responsibility and financial analysts: a review of the literature. *Sustainability Accounting, Management and Policy Journal, 10*(1), 183-207. https://doi.org/10.1108/SAMPJ-05-2017-0043

Hsu, A., Koh, K., Liu, S., & Tong, Y. H. (2019). Corporate Social Responsibility and Corporate Disclosures: An Investigation of Investors' and Analysts' Perceptions. *Journal of Business Ethics, 158*(2), 507-534. https://doi.org/10.1007/s10551-017-3767-0

Huang, W., Luo, Y., Wang, X., & Xiao, L. (2022). Controlling shareholder pledging and corporate ESG behavior. *Research in International Business and Finance, 61*, 101655. https://doi.org/10.1016/j.ribaf.2022.101655

Huang, X., & Watson, L. (2015). Corporate social responsibility research in accounting. *Journal of Accounting Literature, 34*(1), 1-16. https://doi.org/10.1016/j.acclit.2015.03.001

Ioannou, I., & Serafeim, G. (2015). The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. Paper presented at the *, 36*(7) 1053-1081. https://doi.org/10.1002/smj.2268

Isaksson, R., & Rosvall, M. (2020). Understanding building sustainability - the case of Sweden. *Total Quality Management & Business Excellence, ahead-of-print*(ahead-of-print), 1-15. https://doi.org/10.1080/14783363.2020.1853520

Jegadeesh, N., Kim, J., Krische, S. D., & Lee, C. M. C. (2004). Analyzing the Analysts: When Do Recommendations Add Value? *The Journal of Finance, 59*(3), 1083-1124. https://doi.org/10.1111/j.1540-6261.2004.00657.x

Jensen, M. (2001). Value Maximisation, Stakeholder Theory, and the Corporate Objective Function. *European Financial Management: The Journal of the European Financial Management Association, 7*(3), 297-317. https://doi.org/10.1111/1468-036X.00158

Jensen, M. (2010). Value Maximization, Stakeholder Theory, and the Corporate Objective Function. *Journal of Applied Corporate Finance, 22*(1), 32-42. https://doi.org/10.1111/j.1745-6622.2010.00259.x

Kapstein, E. B. (2001). *The Corporate Ethics Crusade*

Khojastehpour, M., & Johns, R. (2014). The effect of environmental CSR issues on corporate/brand reputation and corporate profitability. *European Business Review, 26*(4), 330-339. https://doi.org/10.1108/EBR-03-2014-0029

KPMG International. (2022). *Big shifts, small steps.* (). https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2023/04/big-shifts-small-steps.pdf

Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. *The Journal of Finance, 72*(4), 1785-1824. https://doi.org/10.1111/jofi.12505

Lopez de Silanes, F., McCahery, J. A., & Pudschedl, P. C. (2020). *ESG Performance and Disclosure: A Cross-Country Analysis*. SSRN. https://doi.org/10.2139/ssrn.3506084

Luo, K., & Wu, S. (2022). Corporate sustainability and analysts' earnings forecast accuracy: Evidence from environmental, social and governance ratings. *Corporate Social Responsibility and Environmental Management, 29*(5), 1465-1481. https://doi.org/10.1002/csr.2284

Luo, X., Wang, H., Raithel, S., & Zheng, Q. (2015). Corporate social performance, analyst stock recommendations, and firm future returns. *Strategic Management Journal, 36*(1), 123-136. https://doi.org/10.1002/smj.2219

Mahoney, L. S., Thorne, L., Cecil, L., & LaGore, W. (2013). A research note on standalone corporate social responsibility reports: Signaling or greenwashing? *Critical Perspectives on Accounting, 24*(4-5), 350-359. https://doi.org/10.1016/j.cpa.2012.09.008

Maignan, I. (2001). Consumers' Perceptions of Corporate Social Responsibilities: A Cross-Cultural Comparison. *Journal of Business Ethics, 30*(1), 57-72. https://doi.org/10.1023/A:1006433928640

Margolis, J., Elfenbein, H., & Walsh, J. (2009). Does it Pay to Be Good...And Does it Matter? A Meta-Analysis of the Relationship between Corporate Social and Financial Performance. *SSRN Electronic Journal,* https://doi.org/10.2139/ssrn.1866371

Matsumura, E. M., Prakash, R., & Vera-Muñoz, S. C. (2014). Firm-Value Effects of Carbon Emissions and Carbon Disclosures. *The Accounting Review, 89*(2), 695-724. https://doi.org/10.2308/accr-50629

Mattingly, J. E., & Berman, S. L. (2006). Measurement of Corporate Social Action. *Business & Society, 45*(1), 20-46. https://doi.org/10.1177/0007650305281939

Michaely, R., & Womack, K. L. (1999). Conflict of Interest and the Credibility of Underwriter Analyst Recommendations. *The Review of Financial Studies, 12*(4), 653-686. http://www.jstor.org/stable/2645961

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of who and What Really Counts. *Amr, 22*(4), 853-886. https://doi.org/10.5465/amr.1997.9711022105

Mola, S., Rau, P. R., & Khorana, A. (2013). Is there life after the complete loss of analyst coverage? *Accounting Review, 88*(2), 667-705. https://doi.org/10.2308/accr-50330

Palazzo, G., & Scherer, A. G. (2006). Corporate Legitimacy as Deliberation: A Communicative Framework. *Journal of Business Ethics, 66*(1), 71-88. http://www.jstor.org/stable/25123813

Palmon, D., & Yezegel, A. (2012). R&D Intensity and the Value of Analysts' Recommendations*. *Contemporary Accounting Research, 29*(2), 621-654. https://doi.org/10.1111/j.1911-3846.2011.01117.x

Parguel, B., Benoît-Moreau, F., & Larceneux, F. (2011). How Sustainability Ratings Might Deter 'Greenwashing': A Closer Look at Ethical Corporate Communication. *Journal of Business Ethics, 102*(1), 15-28. https://doi.org/10.1007/s10551-011-0901-2

Pérez, L., Hunt, V., Samandari, H., Nuttall, R., & Biniek, K. (2022, Aug 10,). Does ESG really matter—and why? *The McKinsey Quarterly,* https://search.proquest.com/docview/2700421154

Porter, M. E., & Kramer, M. R. (2006, -12-01T05:00:00Z). Strategy and Society: The Link Between Competitive Advantage and Corporate Social Responsibility. *Harvard Business Review,* https://hbr.org/2006/12/strategy-and-society-the-link-between-competitive-advantage-and-corporate-social-responsibility

PwC. (2020). *Sustainability reporting in Japan and Sweden - a brief comparison.* PwC. Retrieved Mar 2, 2023, from https://www.pwc.com/jp/en/knowledge/column/sustainability-reporting-in-japan-and-sweden.html

Ramanathan, K. V. (1976). Toward a Theory of Corporate Social Accounting. *The Accounting Review, 51*(3), 516-528. http://www.jstor.org/stable/245462

Ramnath, S., Rock, S., & Shane, P. (2008). The financial analyst forecasting literature: A taxonomy with suggestions for further research. *International Journal of Forecasting, 24*(1), 34-75. https://doi.org/10.1016/j.ijforecast.2007.12.006

Reverte, C. (2009). Determinants of Corporate Social Responsibility Disclosure Ratings by Spanish Listed Firms. *Journal of Business Ethics, 88*, 351-366. https://doi.org/10.1007/s10551-008-9968-9

Schramade, W. (2016). Integrating ESG into valuation models and investment decisions: the value-driver adjustment approach. *Journal of Sustainable Finance & Investment, 6*(2), 95-111. https://doi.org/10.1080/20430795.2016.1176425

Singh, J. V., Tucker, D. J., & House, R. J. (1986). Organizational Legitimacy and the Liability of Newness. *Administrative Science Quarterly, 31*(2), 171-193. https://doi.org/10.2307/2392787

Sparkes, R., & Cowton, C. J. (2004). The Maturing of Socially Responsible Investment: A Review of the Developing Link with Corporate Social Responsibility. *Journal of Business Ethics, 52*(1), 45-57. http://www.jstor.org/stable/25075231

Statista. (2023). *Largest stock exchanges in Europe as of October 2022, by domestic market capitalization (in billion U.S. dollars)*. WFE.

Strauss, S., & Zhu, N. (2004). Equity Research as Marketing Tool: The Case of Secondary Market Equity Trading. *SSRN Electronic Journal,* https://doi.org/10.2139/ssrn.607363

Suchman, M. C. (1995). Managing Legitimacy: Strategic and Institutional Approaches. *Amr, 20*(3), 571-610. https://doi.org/10.5465/amr.1995.9508080331

Tamimi, N., & Sebastianelli, R. (2017). Transparency among S&P 500 companies: an analysis of ESG disclosure scores. *Management Decision, 55*(8), 1660-1680. https://doi.org/10.1108/MD-01-2017-0018

Thornton, P. H., & Ocasio, W. (1999). Institutional Logics and the Historical Contingency of Power in Organizations: Executive Succession in the Higher Education Publishing Industry, 1958– 1990. *The American Journal of Sociology, 105*(3), 801-843. https://doi.org/10.1086/210361

Turban, D. B., & Greening, D. W. (1997). Corporate Social Performance And Organizational Attractiveness To Prospective Employees. *Amj, 40*(3), 658-672. https://doi.org/10.5465/257057

Whelan, T., Atz, U., Van Holt, T., & Clark, C. C. (2021). *ESG AND FINANCIAL PERFORMANCE: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015 – 2020.* (). https://www.stern.nyu.edu/sites/default/files/assets/documents/ESG%20Paper%20Aug%202021.pdf

Womack, K. L. (1996). Do Brokerage Analysts' Recommendations Have Investment Value? *The Journal of Finance (New York), 51*(1), 137-167. https://doi.org/10.1111/j.1540-6261.1996.tb05205.x

Wooldridge, J. M. (2012). *Introductory Econometrics: A Modern Approach*. South-Western Educational Publishing.

Zajac, E. J., & Westphal, J. D. (2004). The Social Construction of Market Value: Institutionalization and Learning Perspectives on Stock Market Reactions. *American Sociological Review, 69*(3), 433-457. https://doi.org/10.1177/000312240406900306

Zhang, Y., Wang, H., & Zhou, X. (2020). Dare to Be Different? Conformity Versus Differentiation in Corporate Social Activities of Chinese Firms and Market Responses. *Amj, 63*(3), 717-742. https://doi.org/10.5465/amj.2017.0412

Zheng, Y., Wang, B., Sun, X., & Li, X. (2022). ESG performance and corporate value: Analysis from the stakeholders' perspective. *Frontiers in Environmental Science, 10*, 1084632. https://doi.org/10.3389/fenvs.2022.1084632

Zuckerman, E. W. (1999). The Categorical Imperative: Securities Analysts and the Illegitimacy Discount. *The American Journal of Sociology, 104*(5), 1398-1438. https://doi.org/10.1086/210178

Appendix

A.1 Sample distribution and descriptive statistics

Table 3. Sample Distribution Across Years

Year	*UPSIDE*	*ESG_SCORE*	*E_SCORE*	*S_SCORE*	*G_SCORE*
2008	59	39	39	39	39
2009	60	44	44	44	44
2010	60	45	45	45	45
2011	60	50	50	50	50
2012	60	52	52	52	52
2013	60	53	53	53	53
2014	60	53	53	53	53
2015	62	56	56	56	56
2016	63	59	59	59	59
2017	63	59	59	59	59
2018	40	59	59	59	59
2019	63	61	61	61	61
2020	63	64	64	64	64
2021	63	64	64	64	64
2022	63	64	64	64	64
Total	899	822	822	822	822

Table 6. Pearson correlation coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1 *UPSIDE*	1.000											
2 *ESG_SCORE*	0.126	1.000										
	0.001											
3 *E_SCORE*	0.091	0.920	1.000									
	0.013	0.000										
4 *S_SCORE*	0.174	0.850	0.704	1.000								
	0.000	0.000	0.000									
5 *G_SCORE*	0.158	0.576	0.291	0.348	1.000							
	0.000	0.000	0.000	0.000								
6 *MV_BV*	-0.023	0.034	0.008	0.057	0.037	1.000						
	0.531	0.356	0.824	0.118	0.316							
7 *ROA*	0.047	0.065	0.034	0.114	0.030	-0.094	1.000					
	0.156	0.062	0.335	0.001	0.391	0.004						
8 *CAPEX_TA*	0.023	0.137	0.124	0.175	0.015	0.392	0.092	1.000				
	0.528	0.000	0.001	0.000	0.677	0.000	0.012					
9 *SIZE*	-0.211	0.344	0.304	0.346	0.164	0.021	0.094	-0.057	1.000			
	0.000	0.000	0.000	0.000	0.000	0.559	0.010	0.149				
10 *INTANG_TA*	0.176	-0.221	-0.220	-0.222	0.054	0.034	-0.025	-0.271	-0.224	1.000		
	0.000	0.000	0.000	0.000	0.145	0.329	0.477	0.000	0.000			
11 *LEVERAGE*	-0.074	0.030	-0.008	0.052	0.063	-0.027	-0.195	-0.089	0.116	-0.215	1.000	
	0.044	0.408	0.837	0.153	0.084	0.463	0.000	0.015	0.002	0.000		
12 *ANALYSTS*	0.050	0.350	0.339	0.373	0.082	0.065	0.070	0.157	0.511	-0.082	0.209	1.000
	0.172	0.000	0.000	0.000	0.025	0.073	0.055	0.000	0.000	0.025	0.000	

This table shows the Pearson correlation coefficients for the 750 firm-year observations across the years 2008-2022. The table shows the pair-wise correlation coefficients of the dependent and main independent variables used in the regression models. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG SCORE, E SCORE, S SCORE,* and *G SCORE* are the Bloomberg ESG Disclosure Pillar Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage, defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year.

A2. Sensitivity analysis

Table 15. Baseline regressions with adjusted control variables

Variables	Baseline model (27)	Firm-fixed effects, unbalanced panel (28)
ESG_SCORE (+)	0.016***	0.020**
	(0.005)	(0.006)
PE (-)	0.000	0.000
	(0.000)	(0.000)
MV_BV (-)	0.000	-0.000**
	(0.000)	(0.000)
SIZE (+)	-0.182***	-0.272***
	(0.035)	(0.065)
ROA (+)	0.238	0.589
	(0.308)	(0.358)
CAPEX_TA (+)	-2.946***	0.449
	(0.727)	(0.998)
INTANG_TA (+)	-0.203*	0.785
	(0.114)	(0.559)
LEVERAGE (-)	-0.012**	-0.003
	(0.005)	(0.002)
ANALYSTS (+)	0.008**	0.033**
	(0.004)	(0.010)
CONSTANT	4.359***	5.167***
	(0.787)	(1.172)
Firm effects	No	Yes
Industry effects	Yes	No
Year effects	Yes	Yes
Observations	724	724
Adj. R^2	0.214	0.698
Firms	64	64

The table shows the results from an OLS regression of the potential upside calculation on ESG scores and control variables across the years 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG_SCORE, E_SCORE, S_SCORE*, and *G_SCORE* are the Bloomberg ESG Disclosure Pillar Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. SIZE is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year. Firms are categorized by the Global Industry Classification Standard. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

A3. Robustness tests

Table 16. Robustness test system GMM estimation

Variables	ESG (29)	E (30)	S (31)	G (32)
UPSIDE_LAGGED (+)	0.485***	0.497***	0.480***	0.499***
	(0.161)	(0.161)	(0.162)	(0.162)
SCORE (+)	0.013**	0.004**	0.010**	0.005**
	(0.006)	(0.002)	(0.005)	(0.002)
MV_BV (-)	-0.000**	-0.000**	-0.000**	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
SIZE (+)	-0.225***	-0.220***	-0.219***	-0.219***
	(0.062)	(0.062)	(0.061)	(0.061)
ROA (+)	0.547	0.596	0.440	0.570
	(0.486)	(0.495)	(0.468)	(0.485)
CAPEX_TA (+)	0.425	0.402	0.447	0.482
	(0.800)	(0.798)	(0.815)	(0.809)
INTANG_TA (+)	0.655	0.645	0.669	0.645
	(0.407)	(0.411)	(0.413)	(0.411)
LEVERAGE (-)	-0.006***	-0.007***	-0.006**	-0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
ANALYSTS (+)	0.017**	0.018**	0.017**	0.019**
	(0.008)	(0.008)	(0.008)	(0.008)
CONSTANT	4.743***	4.987***	4.985***	4.709***
	(1.263)	(1.331)	(1.320)	(1.288)
Firm effects	Yes	Yes	Yes	Yes
Industry effects	No	No	No	No
Year effects	Yes	Yes	Yes	Yes
Observations	750	750	750	750
Adj. R^2	0.747	0.744	0.746	0.743
Firms	64	64	64	64

The table presents the results of the System GMM model estimation of the potential upside calculation on ESG scores and control variables across the years 2008-2022. *UPSIDE* is the stock's potential upside for each firm for a focal year. *ESG SCORE, E SCORE, S SCORE*, and *G SCORE* are the Bloomberg ESG Disclosure Pillar Scores, an overall company score based on self-reported information in the environmental, social, and corporate governance pillars. *MV_BV* is the market-to-book value of equity. *SIZE* is the natural logarithm of a firm's market capitalization. *ROA* is the return on assets. *CAPEX_TA* is the number of fixed assets purchased during the fiscal period as a percentage of total assets. *INTANG_TA* is the number of intangible assets as disclosed in the financial reports as a percentage of total assets. *LEVERAGE* is the firm's financial leverage defined as the average assets to average equity. *ANALYSTS* is the number of analysts following a focal firm a focal year. *UPSIDE_LAGGED* is the one-year lag of the dependent variable *UPSIDE*. The expected sign for each coefficient is shown in parentheses by the variable name. Robust standard errors clustered at firm level are shown in parenthesis, significant at levels *** p<0.01, ** p<0.05, * p<0.1.

Figure 1. Scatter plot of residuals

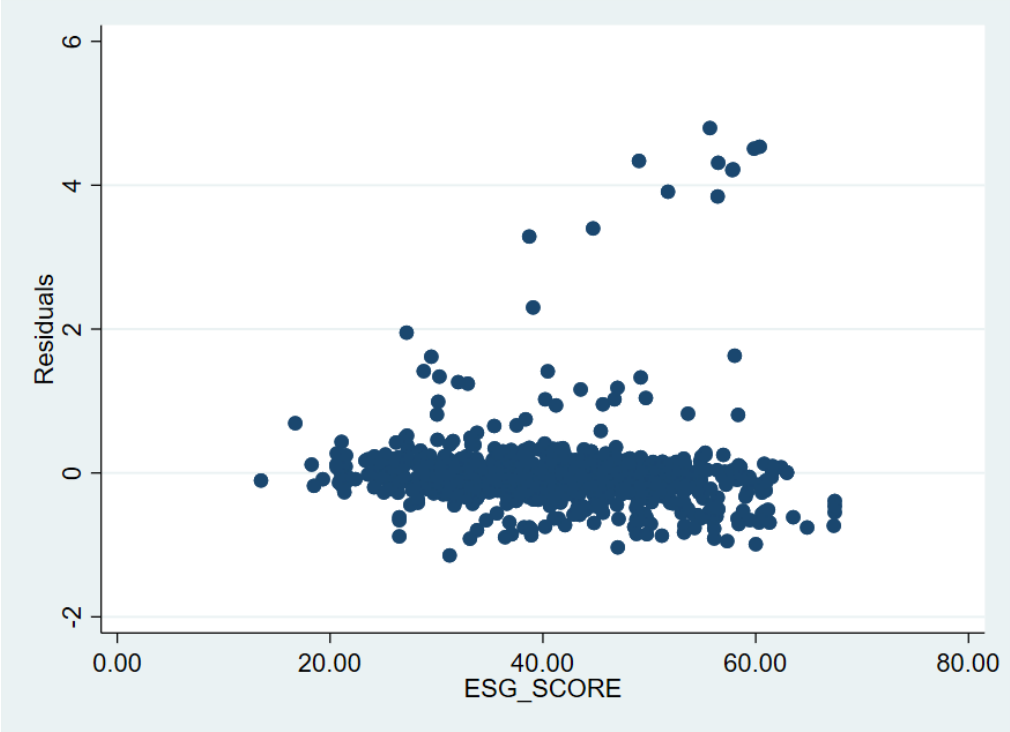

Figure 1 shows a scatter plot of the residuals from the OLS regression of the upside potential of a stock on *ESG_SCORE* and control variables in the baseline model in Table 7. The sample consists of 750 firm-year observations across the years 2008-2022.

Figure 2. VIF multicollinearity test

Variable	VIF	1/VIF
ESG_SCORE	2.87	0.348052
MV_BV_YEARLY	1.33	0.750613
ROA_DECIMAL	1.25	0.798997
CAPEX_TA	2.75	0.362996
SIZE	2.68	0.372487
INTANG_TA	1.86	0.538833
LEVERAGE	1.51	0.662082
NMBR_ANALY~S	3.29	0.304102
YEARS		
2009	2.06	0.485769
2010	2.10	0.477237
2011	2.19	0.455907
2012	2.26	0.442212
2013	2.30	0.433973
2014	2.36	0.423421
2015	2.45	0.408362
2016	2.67	0.374232
2017	2.74	0.364793
2018	2.20	0.454956
2019	2.45	0.407820
2020	3.34	0.299029
2021	3.44	0.290718
2022	3.46	0.288775
INDUSTY_CODE		
2	4.24	0.235976
3	3.27	0.305895
4	1.61	0.619218
5	3.92	0.255224
6	2.47	0.405363
8	6.05	0.165383
9	2.61	0.383641
10	4.55	0.219894
11	1.95	0.513581
Mean VIF	2.72	

Figure 2 shows a variance inflation factor test of the OLS regression of the potential upside of the stock on *ESG_SCORE* and control variables of the baseline model in Table 7. The sample consists of 750 firm-year observations across the years 2008-2022.