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ESG impact on IPO underpricing and short-term performance

Evidence from Nordic countries 2016-2021

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ABSTRACT :

The importance of integrating environmental, social, and governance (ESG) factors into companies' operations has gained global attention in recent years. There is a large number of studies concentrating on the relationship between ESG and financial performance, but ESG and initial public offerings (IPO) are less studied. The previous ESG & IPO studies concentrate more on whether the disclosure before IPO affects underpricing, but not whether higher ESG disclosure leads to reduced underpricing.

IPOs are characterized by information asymmetry between the company insiders and investors. When a company provides ESG information, it increases the information it provides to the public. Thus, when the ESG disclosure is higher, the information asymmetry is reduced. Additionally, the majority of the public information is incorporated into the IPO offer price.

In addition to reduced information asymmetry, investors are increasingly considering ESG factors in their investment decisions. Investors consider ESG factors with traditional financial analysis when making investment decisions.

This study examines the effect of the ESG score on rating an agency to the underpricing of an IPO. In addition, this thesis studies the short-term performance after IPO and do the ESG disclosure level affects that. The data is from Nordic markets from year 2016 to 2021. The study uses OLS regression to investigate the effect of the ESG score on underpricing and short-term performance after IPO. Additionally, this study tests each ESG pillar separately.

The results of the study are mixed. Individual ESG pillars reduce the underpricing with a statistically significant result. However, the regression results are not statistically significant in the short-term performance, or the coefficients are, in economic terms, small. This suggests that the ESG factors do not have explanatory power on the short-term performance after the initial public offering, suggesting that ESG information is incorporated into the offer price, and thus, the effect on short-term performance after IPO is not significant.

KEYWORDS: Initial Public Offering, IPO, underpricing, short-term performance, ESG, environmental, social, governance

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TIIVISTELMÄ:

Ympäristön, yhteiskuntavastuun ja hyvän hallintotavan (ESG) sisällyttäminen yritysten toimintaan on viime vuosina kasvattanut merkitystään maailmanlaajuisesti. Monet aikaisemmat tutkimukset keskittyvät ESG-tekijöiden ja taloudellisen suorituskyvyn väliseen suhteeseen, mutta ESG-tekijöitä ja listautumisia on tutkittu vähemmän. Aiemmissa ESG- ja listautumisantia koskevissa tutkimuksissa on keskitytty enemmän siihen, onko listautumista ennen julkaistulla ESG tiedolla merkitystä alihinnoitteluun, eikä siihen, vaikuttaako yrityksen ESG taso alihinnoittelun.

Listautumisanneissa tyypillistä on tiedon epäsymmetria yrityksen sisäpiirin ja sijoittajien välillä. Kun yritys jakaa ESG informaatiotaan, se lisää yleisölle tarjoamaansa tietoa. Näin ollen, kun julkisesti jaettavan informaation määrä kasvaa, tiedon epäsymmetria vähenee. Lisäksi suurin osa julkisesta tiedosta sisällytetään listautumisannin tarjoushintaan.

Sen lisäksi, että tiedon epäsymmetria vähenee, sijoittajat ottavat yhä useammin huomioon ESG-tekijät sijoituspäätöksissään. Sijoittajat huomioivat yhä enemmän ESG faktorit perinteisen rahoitusanalyysin ohella.

Tässä tutkimuksessa tarkastellaan yrityksen ESG-pisteytyksen vaikutusta listautumisannin alihinnoitteluun. Lisäksi tutkitaan listautumisen jälkeistä suorituskykyä ja sitä, vaikuttaako ESG pisteytys siihen. Aineisto on pohjoismaisilta markkinoilta vuosilta 2016–2021. Tutkimuksessa käytetään OLS-regressiota, jolla tutkitaan ESG-pisteytyksen vaikutusta alihinnoitteluun ja lyhyen aikavälin suorituskykyyn listautumisen jälkeen. Lisäksi testataan jokaista ESG:n kolmea pilaria erikseen.

Tutkimuksen tulokset ovat ristiriitaisia. Yksittäiset ESG-pilarit vähentävät alihinnoittelua tilastollisesti merkittävästi. Regressiotulokset eivät kuitenkaan ole tilastollisesti merkittäviä lyhyen aikavälin suorituskyvyn osalta, tai vaikutus on todella pieni. Tämä viittaa siihen, että ESG-tekijöillä ei ole selittävää voimaa lyhyen aikavälin suorituskykyyn listautumisen jälkeen, mikä viittaa siihen, että ESG-tiedot sisällytetään tarjoushintaan ja väin ollen vaikutus lyhyen aikavälin suorituskykyyn listautumisen jälkeen ei ole merkittävä.

AVAINSANAT: Initial Public Offering, IPO, underpricing, short-term performance, ESG, environmental, social, governance

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1 Introduction

Over time, there has been a debate about what the main responsibility of companies is. Milton Friedman (1970) argues that companies' main responsibility is shareholders' return maximization. The competing theory has been the stakeholder theory popularized by Freeman (1984), in which companies must also consider all the stakeholders. For decades, the majority of companies have prioritized profit maximization and largely disregarded environmental, social, and governance (ESG) responsibilities (Billio et al., 2021). ESG considerations have been viewed as having no impact on financial performance while also being associated with potential increases in costs (Billio et al., 2021).

Over the past two decades, ESG concerns have shown their impact not only on profitability but also on the financial stability of numerous firms (Billio et al., 2021). Moreover, there has been a noticeable increase in global awareness regarding ESG issues (Billio et al., 2021). According to Billio et al. (2021), this trend emerged in response to a combination of factors, including the growing frequency of extreme weather events disrupting infrastructure. In addition, the 2008 financial crisis aftermath had a threefold impact: it underlined the significance of investors' decisions and their inherent role, heightened public awareness of social responsibility, and emphasized the critical importance of governance practices (Billio et al., 2021).

Now, the asset allocation towards sustainable funds is increasing, which shows that investors are increasingly interested in companies' non-financial factors alongside traditional financial factors. At the end of June 2023, 7.9% of total assets under management (AUM) are classified as sustainable (Morgan Stanley, 2023). The inflows to sustainable funds in the first half of 2023 were 2% of the 2022 year-end AUM, whereas the corresponding inflows to traditional funds were 0.3% (Morgan Stanley, 2023). This shows that relatively more assets are allocated to sustainable investments, meaning there is a place for high ESG disclosure companies to become publicly traded.

When a company becomes publicly traded in the initial public offering (IPO), the ownership transitions from private to public (Brealey et al. 2009). By publishing ESG information, the company provides broad information that typically is not in traditional investment reporting and analysis (Reber et al., 2022). The voluntary ESG disclosure during the listing has the potential to enhance the quality of company information; mitigate information asymmetry, which is often captured during the IPO; and convey a commitment to adhering to societal norms regarding sustainable business practices (Reber et al., 2022).

1.1 Purpose of the study

The purpose of this study is to examine how the ESG rating impacts the underpricing of initial public offerings and the short-term stock performance after IPO. Initial Public Offerings are characterized by information asymmetry, which can be reduced by providing ESG information. Lowry & Schwert (2004) find that the majority of public information is incorporated into the final offer price in the initial public offering. When most of the public information is incorporated into the final offer price, this should decrease the underpricing of the IPO. IPO underpricing is an anomaly in the financial markets (Ritter, 1991). For example, Ferri et al. (2023) and Harasheh (2023) find that companies that have disclosed their ESG information before IPO have a reduction in underpricing. Since the studies find a negative correlation between ESG disclosure before IPO and underpricing, this thesis examines the effect how ESG disclosure level effects to underpricing. Specifically, does the higher ESG disclosure affect underpricing.

Previous literature focuses on whether ESG disclosure before the initial public offering reduces underpricing. Thus, this study takes a step forward and examines whether higher ESG disclosure reduces underpricing. All of the companies in the study sample have ESG ratings, and thus, it is expected that the underpricing is reduced based on previous literature. Now, this thesis examines whether the level of ESG disclosure affects the underpricing phenomenon.

After the IPO, the short-term abnormal returns turn to decrease, as Ritter (1991) finds that IPOs are rather overpriced than underpriced when looking further than first-day returns. If the majority of public information is incorporated into the offer price, the valuation of the IPO should be closer to the true value. As the previous literature focuses only on whether the company has disclosed its ESG information or not, this thesis aims to find whether higher ESG disclosure positively affects the short-term performance of IPOs. Or is all of the information incorporated into the offer price, and thus, the effect of ESG after IPO in the short-term is insignificant.

1.2 Hypotheses of the study

This study has developed two hypotheses and a research question from the theoretical framework and previous literature. The research question focuses on whether ESG disclosure affects IPO underpricing and short-term performance after IPO. Specifically, the study seeks to find the answer to the following research question:

“Does the ESG disclosure affect the IPO underpricing and short-term performance after IPO?”

This study has two hypotheses that aim to answer the research question of how the ESG disclosure affects IPO underpricing and short-term performance after IPO. The hypotheses are developed in more detail in the section ESG and IPO, where the theories of initial public offerings, ESG investing, and previous literature on ESG and IPOs are combined into one framework.

The first hypothesis focuses on the underpricing. This study expects that higher ESG disclosure reduces underpricing in initial public offerings. IPO underpricing is a known anomaly in the financial markets (Ritter, 1991). However, the majority of public information is incorporated into the offer price (Lowry & Schwert, 2004). Additionally, high

ESG companies are viewed positively in the markets. Thus, the first hypothesis of this study is:

H_1 : Higher ESG disclosure reduces underpricing.

The second hypothesis focuses on the short-term performance after the IPO. This study expects that higher ESG disclosure leads to higher short-term performance. Ritter (1991) finds that IPO underpricing is a short-term phenomenon, and IPOs are rather overpriced. However, Beaulieu & Mrissa Bouden (2020) find that when adjusted for firm-level idiosyncratic risks, IPOs do not underperform significantly. Higher ESG disclosure reduces ESG-related idiosyncratic risks, and thus, the second hypothesis of this study is:

H_2 : Higher ESG disclosure leads to higher short-term performance.

1.3 Possible contribution

Previous literature has focused on whether the ESG disclosure before IPO reduces underpricing. Ferri et al. (2023), Fu et al. (2023), and Harasheh's (2023) findings show that companies that have disclosed publicly their ESG disclosure before IPO are less underpriced. However, the study of Economidou et al. (2023) has converse findings.

In addition to IPO underpricing, Fu et al. (2023), Reber et al. (2022), and Economidou et al. (2023) study whether the ESG disclosure before IPO affects the aftermarket performance. All of these studies have consistent findings. ESG disclosure before IPO enhances the aftermarket performance and reduces the downside risk. However, Harasheh (2023) finds different results. His findings indicate that the aftermarket return and ESG factors are weakly correlated, suggesting that ESG information is incorporated into stock returns over time.

This thesis takes a step forward and studies whether higher ESG disclosure affects IPO underpricing and aftermarket performance. These findings provide information to companies on whether it is worth investing in ESG activities or whether a lower level of ESG disclosure is still sufficient to capture more money in the initial public offering. By studying the aftermarket performance, this thesis provides insights into whether the ESG disclosure level affects short-term performance after IPO.

Additionally, this thesis provides region-specific insights. The study concentrates on Nordic markets in recent years. Thus, the results show how the ESG factors have influenced the IPO underpricing and post-IPO performance. Specifically, are high ESG disclosure companies less underpriced, and does higher ESG disclosure lead to higher short-term performance after the IPO, or is all the ESG information already incorporated into the final offer price.

1.4 Structure of the study

The structure of the study is as follows. First, after the introduction chapter, the second chapter goes through the IPO process, underpricing, and the studies of post-IPO performance. The third chapter presents the development of ESG and what ESG is now. Then, the fourth chapter goes through what is socially responsible and ESG investing and the motivation behind those frameworks. The last theoretical chapter, the fifth chapter, goes through the previous studies of ESG and IPO and develops the hypotheses of this thesis.

After the theoretical background, the empirical part of the study. The sixth chapter presents the data and the methodology of the study to test the hypotheses. That is followed by the regression results in the seventh chapter. Finally, the eighth and last chapter of the thesis discusses the results and limitations of the study, and suggests future research possibilities.

2 Initial Public Offerings

Initial public offering (IPO) refers to the initial issuance of a stock by a company to the public (Brealey et al., 2009). There are plenty of motivations for a company to go public, but according to Brau & Fawcett (2006), there are two obvious advantages. Initially, an IPO can infuse a substantial amount of capital into the financial resources of the company. Furthermore, a successful IPO has the potential to generate significant profits for company insiders and pre-IPO investors.

Brau & Fawcett (2006) conducted a survey of 336 CFOs to find motivations behind a company going public. The motivations behind IPOs, according to their study, are, for example, to create public shares for use in future acquisitions, to establish a market value for the company, to enhance the reputation of the company, to minimize the cost of capital, and to broaden the ownership of the company (Brau & Fawcett, 2006). However, nonfinancial factors have limited significance for most firms (Ritter & Welch, 2002).

IPO markets are typically divided into hot and cold markets, and there are also in-between “middling markets.” When the market is hot, there is typically a high volume of offerings and oversubscriptions of offerings, and conversely in cold markets (Helwege & Liang, 2004). However, Helwege & Liang (2004) find that the characteristics of issuing companies do not significantly differ whether the market is hot or cold. There is no higher degree of concentration in particular industries, the quality of issuing companies does not differ significantly, and the age of the issuing company does not differ with the hot or cold market. Their findings do not indicate that new inventions drive the hot IPO markets.

The IPO market fluctuates over time due to various economic, financial, and market conditions. The current economic outlook is affected, for example, by war, geopolitical instability, and extreme weather conditions (Magnusson & Bergvall, 2023). Inflation has risen above the core inflation, followed by interest rate hikes by central banks. However, the inflation has slowed now, but the pace at which it will decline will have a significant

implications for central banks policies, growth prospects, and financial markets (Magnusson & Bergvall, 2023).

The market uncertainty has affected initial public offerings, as seen in Figure 1. There are 991 initial public offerings globally YTD 2023 (data retrieved on the 4th of October, 2023), that are common stocks and in the stage trading (Bloomberg Finance L.P.). The global change in the number of IPOs is -5% in the first three quarters of 2023, compared to the first three quarters of 2022 (Chan, 2023). However, even though the capital markets have performed strongly, and the volatility has decreased in the first half of 2023, the IPO activity continues to be limited in both the US and Europe (PwC, 2023). According to PwC market analysis of IPO markets in Q2 2023, investors are now demanding significant discounts in IPOs. Further, whereas investors demand underpricing to initial public offerings, EY's outlook of the IPO market Q3 2023 shows a significant improvement in post-IPO share performance in Q3 compared to the previous quarters.

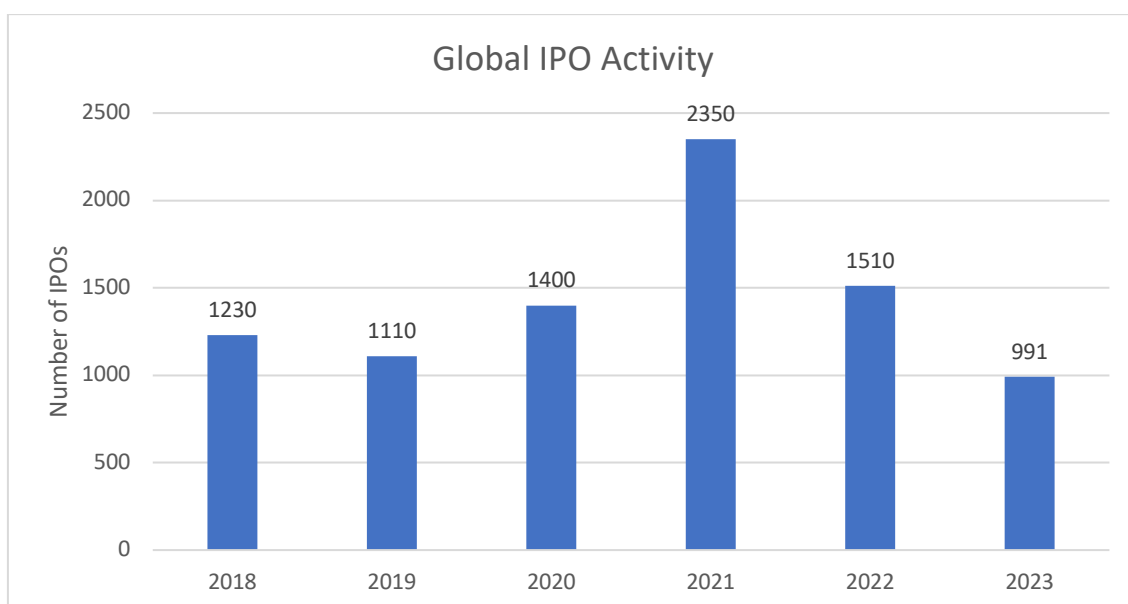


Figure 1. Global IPO Activity by number of IPOs (Bloomberg Finance L.P.).

The Nordic markets follow the global trend of decreasing the amount of initial public offerings. As seen in Figure 2, the Nordic trend is following the global trend. In 2021, the IPO market has been hot, after which the number of IPOs has clearly decreased. In 2023

IPOs, two IPOs are listed on the Oslo stock exchange, and one is listed on the Copenhagen stock exchange (data retrieved on the 4th of October 2023 from Bloomberg Finance L.P.). The data is restricted to IPOs that are in the stage of “trading,” and the listing is an initial public offering of common shares.

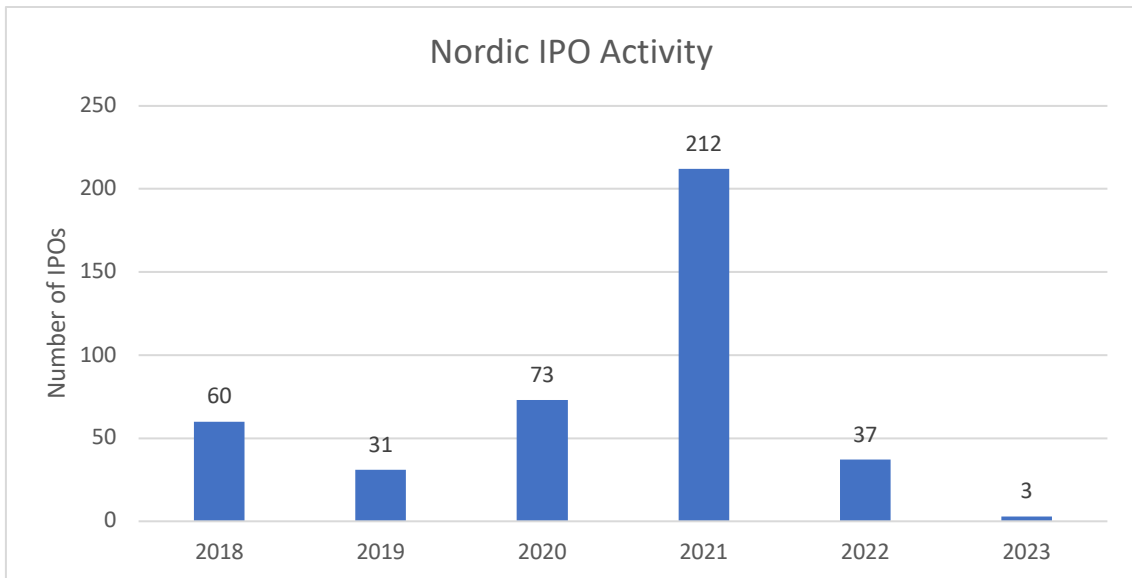


Figure 2. Nordic IPO activity by number of IPOs (Bloomberg Finance L.P.).

2.1 Process

This section goes through the IPO process in outline without going into detail. First, after the underwriter is selected, the initial public offering needs to be valued. After valuing the IPO, the shares need to be priced. The IPO pricing process begins with setting the preliminary offer price range (Roosenboom, 2012). The preliminary offer price range is set before investors participate in the pricing process (Roosenboom, 2012).

The underwriter starts by canvassing investor demand for the shares during a road show or an auction (Roosenboom, 2012). How much the price changes during the roadshow and how much the publicly available information is incorporated into the preliminary price range is discussed later.

After the roadshow, the final offer price is determined. The final offer price affects the initial returns, whether the issue is underpriced or overpriced. In practice, a significant number of IPOs use the method of book building (Ritter, 2011). This approach involves determining the offer price after receiving indications of interest from institutional investors and granting underwriters the authority to allocate shares at their discretion (Ritter, 2011). Figure 3 illustrates the IPO process from valuation to first-day market price.

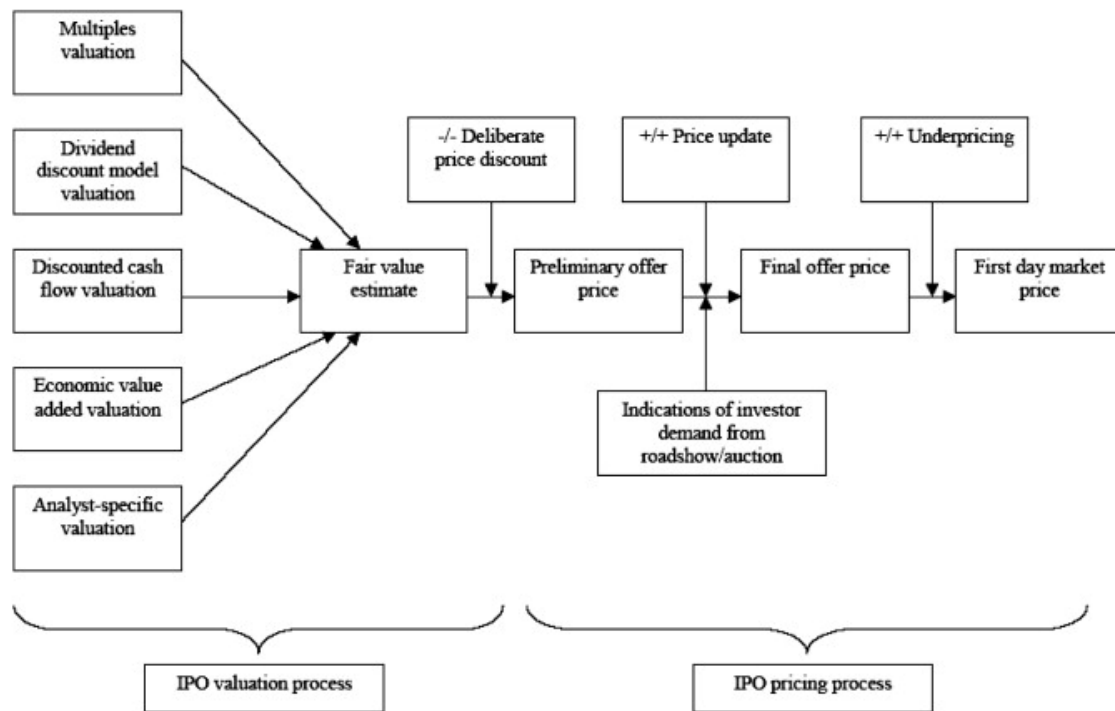


Figure 3. IPO process (Roosenboom, 2012).

2.1.1 Valuation

As many companies going public are young growth companies, their future cash flows are hardly predictable (Kim & Ritter, 1999). That is one reason why comparable multiples are a common approach to IPO valuations. Roosenboom (2012) studies the French market in the years 1990-1999, finding that comparable companies or comparable transaction methods are used in 87% of the IPO valuations. Both the dividend discount model and discounted cash flow analysis are used in 59.2% of IPOs in Roosenboom's (2012)

study sample. All of these valuation methods have similar biases, accuracy, and explanatory power (Roosenboom, 2012). This indicates that none of these methods is particularly superior to the other, and therefore, several valuation methods are combined in the final offer price (Roosenboom, 2012).

The comparable companies are commonly chosen based on industry and/or size, and the most used multiple is price-to-earnings ratios, which is followed by price-to-cash flow ratios, price-to-sales ratios, and enterprise value (EV) ratios (Roosenboom, 2012). However, in the European market from 1999 to 2012, the most frequently used multiples after the price-to-earnings ratio are EV to Sales and EV to EBITDA (Paleari et al., 2014). According to Roosenboom (2012), the estimated value is determined by multiplying the average or median accounting-based multiple of the peer group with the equivalent accounting figure of the IPO firm. They find that, on average, the underwriter chooses 6.3 comparable firms. This is consistent with Paleari et al. (2014) who find that, on average, the underwriter chooses 5.8 comparable firms. The transaction multiples are similar; underwriters employ valuation multiples derived from previous mergers and acquisitions (M&A) or IPO transactions within the corresponding industry (Roosenboom, 2012).

However, there is a problem with choosing comparable companies. Paleari et al. (2014) study the effect of underwriters' discretion when selecting comparable companies. They find that, on average, the underwriters' chosen comparable companies have 13-38% higher valuation multiples than those identified using matching algorithms or selected by sell-side analysts (Paleari et al., 2014). One possible explanation for this selection exclusion is that in doing so, the offer price may be increased and still make the IPO appear discounted relative to its peers (Paleari et al., 2014). These findings indicate the IPOs' long-run underperformance as the IPOs seem to be overpriced, which is discussed more in section 2.3. After valuation, the next step is pricing. The pricing and the information that is incorporated into the offer price are discussed next.

2.1.2 Information incorporated into pricing

The underpricing of IPOs is a widely researched topic in finance, and many theories propose that the underpricing of IPOs is due to asymmetric information. The IPO underpricing is discussed later, first reviewing how much public information is incorporated into the preliminary price range and the final offer price. If the underwriter does not incorporate all the public information in the offer price, the underwriter can provide a “free lunch” to the investor in efficient markets. By definition, an efficient market is a “Market in which security prices reflect information instantaneously” (Brealey et al., 2009).

Lowry & Schwert (2004) study how underwriters incorporate public information into the preliminary price range and the final offer price. The initial price range is indicative of the underwriters’ pricing expectations for the offering. At this stage, Lowry & Schwert (2004) find that not all public information is incorporated into the initial price range. However, they note that the economic significance is relatively low, indicating that most public information is incorporated in the initial stage.

Between the filing and the offering, the IPO price is changing, for example, due to the information learned during the roadshow and the market movements (Lowry & Schwert, 2004). During the roadshow, underwriters aim to acquire information on the company's actual value. The inclusion of this additional information in the offer price potentially reduces the under- or overpricing.

Lowry & Schwert (2004) find that the price updates indicate that underwriters incorporate a greater degree of negative information into the offer price compared to positive information. For example, a market return of -10% leads to a corresponding price update of -9.7%, whereas a market return of +10% leads to a corresponding price update of +2.2%. It is unclear why the offer price is adjusted relatively little when market returns are positive (Lowry & Schwert, 2004). However, neither the issuer nor the underwriter wants the IPO to be overpriced and, therefore, unattractive to investors. This explains

the larger adjustment of price updates in response to negative information (Lowry & Schwert, 2004).

Lowry & Schwert (2004) find that when the price updates to the final offer price are negative, the first-day return tends to be lower. This follows their prior finding that the negative information is more incorporated into the final offer price. Ritter (2011) finds consistently to Lowry & Schwert (2004) that for IPOs that use book building and whose price is updated downward, the first-day return is close to zero, whereas the upward revision yields an average of 50% first-day return. This aligns with the underwriters' objective of mitigating losses associated with overvalued securities while simultaneously enabling well-informed investors to partake in the profits generated by undervalued securities (Lowry & Schwert, 2004).

The economic significance of price changes on initial returns is greater compared to market returns on initial returns (Lowry & Schwert, 2004). One standard deviation change during the filing period on market returns results in a 0.08 change in initial returns. In turn, one standard deviation change in the price update results in a 0.40 standard deviation change in initial returns.

The results of Lowry & Schwert (2004) imply that the majority of public information is incorporated into the final offer price, whereas it is not yet in the preliminary price range. However, that does not imply market inefficiency, as the preliminary price range is not the price at which the investor buys shares.

2.2 Underpricing

The pricing of IPOs is a complex phenomenon in finance, as IPOs are often underpriced. Underpricing of IPOs is one known anomaly in initial public offerings markets (Ritter, 1991). IPO underpricing refers to the situation in which the IPO's offer price is below the

first-day market closing price (Brau & Fawcett, 2006). It is worth noting that the underpricing of IPOs is not only related, nor is the magnitude significantly different, in hot or cold IPO markets (Helwege & Liang, 2004).

In the U.S., during the period from 1960 to 2004, the average underpricing stood at 18% (Brau & Fawcett, 2006). This statistic indicates that investors participating in the primary market earned an average one-day return of 18%, whereas the comparable market return average is 0.05%. During the Internet bubble, from November 1998 to April 2000, the average first-day return was over 30% every month (Ritter & Welch, 2002). In addition, Ritter & Welch (2002) find that roughly 70% of IPOs concluded their first day of trading with a higher closing price than the initial offer price, and approximately 16% of IPOs' first-day return equals zero.

Figure 4 shows the number of IPOs and equally weighted average first-day return in the U.S. major exchanges from 1980 to 2022 (Ritter, 2023). As seen in the figure, during the recent years, underpricing has been growing since 2017, except for the drop in 2021 when there were clearly hot IPO markets.

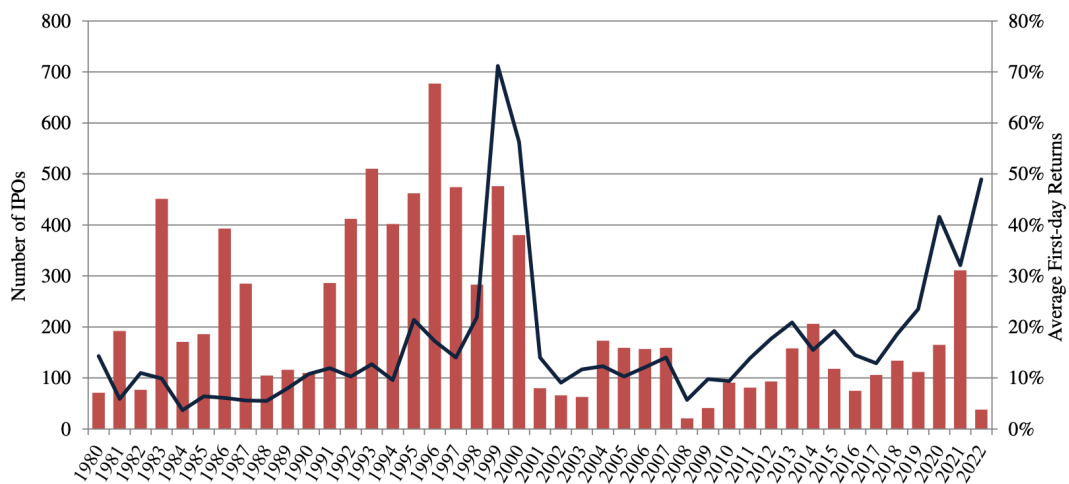


Figure 4. The number of IPOs and average first-day returns from 1980 to 2022 (Ritter, 2023).

According to Brau & Fawcett (2006), the CFOs are well-informed of the extent of underpricing, as their median expectation of underpricing is 10%, and the actual median of underpricing is 13.5% in their study. The most popular answer in Brau & Fawcett's (2006) study to question why underpricing exists is to compensate investors for taking the risk of the IPO. Other reasons they find are, for example, to increase the post-issue trading volume of the stock, underwriters underprice to incur the favor of institutional investors and to ensure a wide base of owners.

When the motivation to go public for the company is to raise capital, why is the company leaving money on the table? There are several theories to explain the phenomenon of positive average first-day returns on IPOs. A common approach to categorizing theories is based on the assumption of either asymmetric information or symmetric information (Ritter & Welch, 2002). The asymmetric information view is the basis of more theories (Ritter, 2011).

2.2.1 Asymmetric theories

Asymmetric information means that one party has more information available than the other. In the IPO context, the asymmetric information is between investors and the issuing company. The issuing company typically possesses more information regarding the prospects, risks, and value of their company than investors do (Brealey et al., 2009). In all theories of underpricing driven by asymmetric information, there is a consensus prediction of a positive correlation between the degree of underpricing and the level of asymmetric information (Ritter & Welch, 2002). Under the assumption that the level of asymmetric information uncertainty tends towards zero, the phenomenon of underpricing is eliminated (Ritter & Welch, 2002).

When the issuer is more informed compared to an investor, high-quality issuers want to differentiate themselves from low-quality issuers (Ritter & Welch, 2002). According to Ritter & Welch (2002), only issuers with below-average quality are willing to sell their

shares at the average price. Due to that, issuers of higher quality intentionally offer their shares at a lower price than the perceived market value to demonstrate their high quality by leaving money on a table (Ritter & Welch, 2002). From a theoretical perspective, the efficiency of underpricing as a signal is not well justified in comparison to alternative strategies such as committing to charitable donations or advertising expenditures (Ritter & Welch, 2002).

It is also possible that an investor holds more information than the issuer, for example, about the general market demand for the shares. Then, the issuer encounters an uncertain level of interest for its shares (Ritter & Welch, 2002). This information asymmetry can be partly filled after the preliminary offer price range is set and book building is started (Ritter & Welch, 2002). The underwriter starts to gauge investors' interest during a "road show," and the preliminary offer price is adjusted based on any positive information regarding investor demand (Roosenboom, 2012). Therefore, one explanation for underpricing in IPO is that it serves as a form of compensation for investors to reveal their desire for shares.

The information that investors hold differs in addition, which is one explanation for underpricing. The investors can be divided into informed and uninformed investors, where the informed investors know the true value of the issue (Ritter, 2011). Informed investors only purchase orders when the offer price is equal to or lower than their known true value (Ritter, 2011). This leads to a "winner's curse" for uninformed investors, as they acquire all of the shares when the offer is overpriced but obtain only a portion of the shares when the offer is underpriced (Ritter, 2011). According to Ritter (2011), to compensate uninformed investors, it is necessary for IPOs to be, on average, underpriced.

Another factor contributing to underpricing, can be ascribed to an intentional reduction in price that takes place prior to the collection of any information regarding investor demand, and before the final offer price is set (Roosenboom, 2012). According to Roosen-

boom (2012), underwriters employ deliberate price discounts to enhance investor demand. Consequently, there is an increase in price changes before the final offer price, which partially recoups the discount. However, it is seen that there is a lack of complete adjustment; a portion of the intentional reduction in price persists, leading to increased returns for investors (Roosenboom, 2012).

2.2.2 Symmetric information theories

Roosenboom (2012) finds several other factors that affect the underpricing that are not related to asymmetric information. In the book-building phase, the high-reputation underwriters have lower intentional price discounts. This phenomenon can be attributed to the idea that underwriters with a larger share tend to have a broader network and access to a substantial pool of potential investors (Roosenboom, 2012). This is consistent with the study of Lowry & Schwert (2004), where they find that high-reputation underwriters price the issue closer to its true value.

The magnitude of the price discount is inversely related to the projected profitability of enterprises (Roosenboom, 2012). Furthermore, Roosenboom (2012) finds a positive correlation between price updates and expected sales growth. In addition, the price updates of initial discounts are higher when stock market returns are higher. Conversely, price updates tend to be lower when the stock market is more volatile. However, this finding is inconsistent with the finding of Lowry & Schwert (2004). They find that the negative market returns are incorporated into the final offer price more fully than positive market returns, as discussed earlier.

Roosenboom (2012) finds that older companies have lower levels of underpricing, whereas technology companies tend to encounter higher levels of underpricing. This is supported in the study of Ritter & Welch (2002) when they find a significant underpricing of IPOs during the internet bubble. The underwriters could not justify the higher offer

price for internet-based IPOs, due to, at least partly, concerns about potential legal liabilities, particularly considering the already inflated values associated with these companies (Ritter & Welch, 2002). There is limited evidence to suggest that other company characteristics substantially influence underpricing (Roosenboom, 2012).

2.3 IPO Performance

The IPO long-run performance is a widely studied phenomenon in finance with the IPO underpricing, which seems to be a short-run phenomenon (Ritter, 1991). This can be seen, that in the long run IPOs seem to be rather overpriced than underpriced (Ritter, 1991). The long-run performance is a subject of interest in several points of view. For example, for investors, the presence of price patterns can potentially offer possibilities to achieve higher profits with active trading strategies (Ritter, 1991). In addition, as there is fluctuation in the volume of IPOs over time, the possible correlation between low long-term performance and volume periods, the issuers can effectively time their issuances to capitalize on favorable market conditions (Ritter, 1991).

There is no consensus on the appropriate methodology for measuring the long-run performance of IPOs (Ritter, 2002). Two widely used techniques are focusing on absolute performance or/and performance relative to benchmark, also known as abnormal returns (Ritter, 2002). When comparing publicly listed firms with similar market capitalization and book-to-market values as a benchmark, it becomes evident that the underperformance in the market observed in IPO firms continues as IPOs are often small growth firms (Ritter, 2002). This category has often been the worst-performing category. Beaulieu & Mrissa Bouden (2020) have a different approach to the issue, studying how firm-level idiosyncratic risk impacts the long-term performance of IPOs and matching non-IPO companies.

The study by Beaulieu & Mrissa Bouden (2020) focuses on the U.S. markets from 2000 to 2009. They find that the majority of IPOs do not underperform compared to their

benchmarks after long-term abnormal returns are adjusted for firm-level idiosyncratic risk. Additionally, they find that there is a significant amount of underperformance observed in IPOs with high levels of idiosyncratic risk, for example, in the technology companies' issues. Furthermore, the results indicate that these IPOs exhibit higher levels of idiosyncratic risk than benchmark companies, especially in the initial aftermarket phase. However, this idiosyncratic risk approaches benchmark companies after three years of IPO trading.

Ritter (1991) studies the IPOs in the U.S. market from 1975 to 1984, finding that throughout the three-year period subsequent to the IPO, these companies significantly underperform compared to a group of firms in the same size and industry. The average holding-period return for these IPOs is 34.47% in the 3 years after going public, whereas the comparable companies' same 3 years holding-period return is 61.86%. In addition, Ritter (1991) finds that the skewness of the distribution of IPO 3-year holding period returns is greater than that of the comparable companies. The median 3-year holding-period return for these IPOs is -16.67%, whereas for comparable companies, it stands at 61.86%.

Ritter (2002) continues studies in the U.S. market, in the period from 1980 to 2001. This study takes into consideration market-adjusted return and style-adjusted return. Ritter (2002) finds that the average three-year market-adjusted return for IPOs is -23.4%, whereas the average style-adjusted return is -5.1%. This indicates that the comparable companies, in terms of market capitalization and book-to-market ratio, exhibit underperformance to the overall market, similar to IPO. Thus, IPOs exhibit relatively modest underperformance when comparing companies with similar sizes and market-to-book ratios. When using Fama-French regressions, the underperformance in a three-year period is -7.6% (Ritter, 2002).

The underperformance of IPOs in addition varies whether the market condition is "hot" or "cold." Lin et al. (2021) study the IPOs in the U.S. markets from 1970 to 2008. They find that issues during the hot markets have a tendency to underperform relative to their

comparable companies in the long run. The cold market issues, however, do not exhibit significant long-run underperformance compared to comparable companies (Lin et al., 2021). Their findings are consistent with Ritter (1991), who finds a negative relation between annual issue volume and the long-run performance of IPO. One explanation for this is that companies choose to go public when investors demonstrate a willingness to pay high multiples, such as price-earnings or market-to-book ratios (Ritter, 1991). These multiples signify positive evaluations of the net present value associated with potential growth prospects (Ritter, 1991). However, when the multiples are too high, the long-term performance suffers.

The finding that underperformance varies with the market conditions is inconsistent with Helwege & Liang (2004), whose study sample consists of initial public offerings from 1975 to 2000. However, the approach is to compare to market indexes. In a five-year period after the IPO, Helwege & Liang (2004) do not find significant differences in profits, size, or sales growth between hot market issues and cold market issues. In the short term, they find that hot market companies generally exhibit lower performance.

3 ESG

The acronym ESG consists of three pillars, where E stands for environment, S for social, and G for governance (UNGN, 2004). However, the history of debate on whether companies should concentrate on wider societal issues in their operations goes further than 2004, when the United Nations Global Compact first presented the term ESG. The issues on which each pillar focuses are presented in the sub-chapter, but before that, we focus on the development of ESG and the companies' responsibilities.

3.1 Shareholder & Stakeholder Theories

In the past, the debate has focused on whether companies should maximize their short-term profits, as in shareholder theory, or should companies concentrate on longer-term value maximization for the broader society, as in stakeholder theory (Zumente & Bistrova, 2021). These are two old theories that propose what the role of companies in society should be (Smith, 2003).

Milton Friedman presented shareholder theory in 1970, which is one of the earliest and most influential theories proposing the role of companies in society. According to Friedman (1970), companies themselves cannot have social responsibilities. The company managers must act in accordance with the shareholders' interest, which is usually to maximize profits in accordance with society's both legal and ethical norms (Friedman, 1970). If a company is engaged in social responsibility, the company managers are spending shareholders' or customers' money (Friedman, 1970).

Freeman (1984) popularizes the competing theory to shareholder theory, which is the stakeholder theory. According to Clarkson & Clarkson (1998, pp. 2-3), the company stakeholders can be divided into voluntary or involuntary stakeholders. The voluntary stakeholders include, for example, shareholders, employees, customers, and suppliers. Invol-

untary stakeholders include, for example, society and the environment, which are involuntarily exposed to the potential risks, but also benefits associated with company operations. The company managers must act in accordance with all stakeholders' interests and in a way, that facilitates the sustained long-term success of the company (Freeman & McVea, 2001).

The key difference between Shareholder theory and Stakeholder theory is that the Stakeholder theory requires companies' managers to consider the interests of all stakeholders, even when it may reduce the profit maximization goal (Smith, 2003). The stakeholder theory considers that companies interact not only with shareholders, whereas the shareholder theory primarily centers on the interest of shareholders.

3.2 CSR

Corporate Social Responsibility, CSR, is the previous area of emphasis before ESG (Pérez et al., 2022). According to Gillan et al. (2021) & Pérez et al. (2022), CSR describes companies' actions that are socially responsible, while ESG describes how companies integrate ESG issues into their core business model. In addition, ESG considers the governance of companies directly, while CSR includes the governance aspect when it is related to environmental and social issues (Gillan et al., 2021).

Corporate Social Responsibility has several definitions. According to Carroll (1979), CSR consists of four dimensions: economic responsibilities, legal responsibilities, ethical responsibilities, and discretionary responsibilities. Economic responsibilities are to produce and sell goods and services with a profit; Legal responsibilities are to operate under the laws and regulations; Ethical responsibilities are to operate according to ethical norms; and Discretionary responsibilities are to fulfill the societies' expectations that do not come from economic, legal, or ethical responsibilities. These Discretionary responsibilities are voluntary activities, which can be, for example, training programs for unemployed people or providing daycare for working mothers (Carroll, 1979). Figure 5 shows

Carroll's (1979) presented CSR categories and the relative magnitude of each category. Companies must meet the dimensions simultaneously in order to operate in corporate socially responsible way (Carroll, 1979).

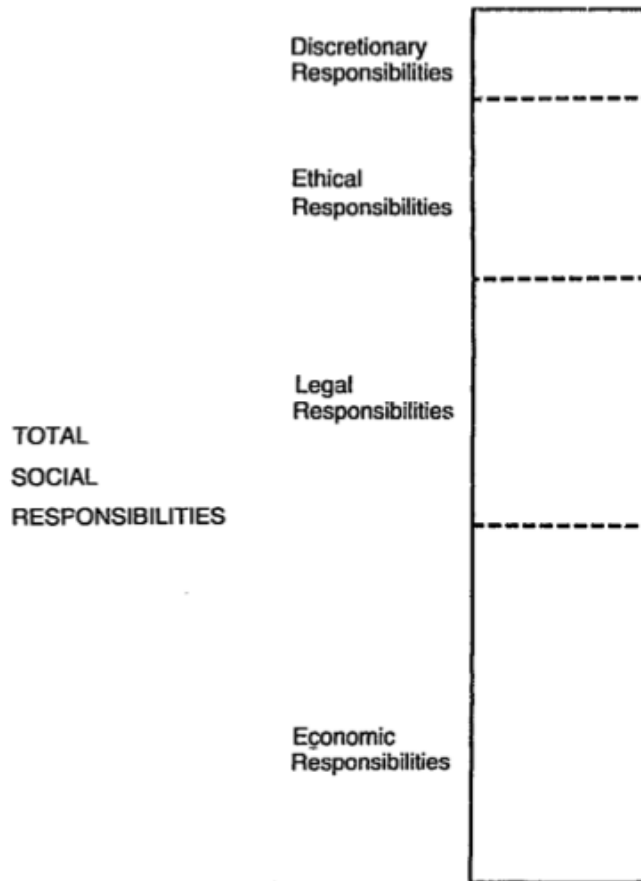


Figure 5. The categories of CSR (Carroll, 1979).

According to the European Union (2011) definition, CSR is companies' responsibility for their impact on society. To be socially responsible, companies need to integrate social, environmental, ethical, and consumer & human rights aspects into their operations. In addition, companies are expected to maximize value creation for shareholders and society and simultaneously identify, prevent, and reduce negative impacts (EU, 2011). In Rayman-Bacchus et al. (2004, pp. 2-3) definition, CSR describes the relationship that should exist between companies, individuals, and society. The fundamental principle of CSR is that companies have responsibilities to society that extend beyond the profit maximization goal (Weber et al., 2018, p. 6).

3.3 ESG

ESG as an abbreviation is a fairly new term, but the roots are further, as discussed earlier. The primary objective of the UNGC (2004) report about ESG was to establish comprehensive standards and suggestions on how to integrate environmental, social, and governance issues in asset management, securities brokerage services, and associated research operations. The abbreviation consists of three individual pillars: environment, social, and governance.

Nowadays, ESG factors are non-financial metrics to assess companies' activities related to these three areas (Kim & Li, 2021). According to Billio et al. (2021), past years have shown that environmental, social, and governance issues impact not only profitability but also the financial sustainability of companies. The ESG factors are used alongside a traditional fundamental analysis in investment decisions (Kim & Li, 2021).

The environmental pillar focuses on the impact related to the environment, such as climate change and biodiversity loss (Billio et al., 2021). The social pillar focuses on social impact, which includes, for example, gender policies, labor standards, and workplace & product safety (Billio et al., 2021). The governance pillar focuses, for example, on control procedures, independence and diversity of the board, and shareholders' rights (Billio et al., 2021). Figure 6 shows the themes and issues that are considered in the ESG rating process in MSCI's rating process.

Each pillar of ESG is evaluated separately, and in addition to individual scores, companies receive an overall ESG score. The overall ESG score calculations differ between the rating agencies. There are several ESG score providers, which all focus on similar themes and issues. However, the methodologies and emphasis areas are different.

3 Pillars	10 Themes	33 ESG Key Issues
Environmental	Climate Change	Carbon Emissions
		Climate Change Vulnerability
		Financing Environmental Impact
		Product Carbon Footprint
	Natural Capital	Biodiversity & Land Use
		Raw Material Sourcing
		Water Stress
	Pollution & Waste	Electronic Waste
		Packaging Material & Waste
		Toxic Emissions & Waste
	Environmental Opportunities	Opportunities in Clean Tech
		Opportunities in Green Building
Opportunities in Renewable Energy		
Social	Human Capital	Health & Safety
		Human Capital Development
		Labor Management
		Supply Chain Labor Standards
	Product Liability	Chemical Safety
		Consumer Financial Protection
		Privacy & Data Security
		Product Safety & Quality
	Stakeholder Opposition	Responsible Investment
		Community Relations
	Social Opportunities	Controversial Sourcing
		Access to Finance
Access to Health Care		
Governance	Corporate Governance	Opportunities in Nutrition & Health
		Board
		Pay
		Ownership & Control
	Corporate Behavior	Accounting
		Business Ethics
		Tax Transparency

Figure 6. ESG Themes and ESG Issues (MSCI, 2023)

The ESG rating has received criticism, a lot of which comes from the lack of globally accepted standards and methodologies. There are about 160 ESG rating providers, which all have their own methodologies, definitions, and sources of non-financial information (Simpson et al., 2021). In addition, the nonfinancial information tends to rely on companies self-reporting (Simpson et al., 2021).

Although the information sources tend to converge, the information processing differs, which can result in divergent assessments (Billio et al., 2021). Furthermore, Billio et al. (2021) find that the agreement among these rating providers is significantly low. This can be compared to credit ratings, where credit rating agencies typically provide similar ratings due to their reliance on comparable financial data and their shared objective of assessing the likelihood of a company defaulting on its debt obligations (Simpson et al., 2021).

However, there have already been improvements in ESG measurements. The trend is in the direction of consolidating ESG reporting and disclosure frameworks (Pérez et al., 2022). The alignment is toward more active regulation with more detailed and specific requirements (Pérez et al., 2022). It is important to consider that, in addition, the development of financial accounting did not emerge in its current comprehensive form (Pérez et al., 2022). These kinds of processes and new standards take time to develop.

4 Socially Responsible & ESG Investing

ESG investing is closely related to Socially Responsible Investing (SRI), and ESG investing is developed from SRI. There is no universally accepted term for SRI nor ESG Investing, leading to the terms being used parallelly (Martini, 2021; S&P Global, 2020). SRI and ESG investing provide a framework for evaluating the social impact of investments that are used with traditional financial risk analysis (Martini, 2021; S&P Global, 2020).

According to S&P Global's (2020) definition, socially responsible investing prioritizes positive social change by including both financial returns and ethical values in investment decisions. This approach prioritizes the consideration of investors' moral principles in the decision-making, with financial returns being regarded as a secondary factor. S&P Global (2020) defines ESG investing as the incorporation of ESG risks and opportunities into decision-making. This consideration is based on the understanding that such factors can significantly influence the performance of organizations. Investors that incorporate ESG factors can engage in sustainable investments without compromising their financial returns, compared to SRI (S&P Global, 2020). According to Hicks (2023), the fundamental of ESG is mitigating risks. ESG investors evaluate the potential risks of a company's future performance due to its ESG practices (Hicks, 2023).

The history of Socially Responsible Investing can be traced back to over 2,000 years ago, when the practice of social screening became prevalent within religious communities (Martini, 2021). However, up until the middle of the twentieth century, SRI has been religion-centered and small, focusing on negative screening (Martini, 2020). Through negative screening, investors eliminate certain industries, companies, and countries from their portfolios (GSIA, 2020). This exclusion is based on their involvement in activities that are deemed controversial according to societal norms and values (GSIA, 2020).

The contemporary socially responsible investing movement started revolving in the 1960s and 1970s, for example, by the utilization of boycotts, divestments, and sanctions against South African corporations in response to the Apartheid Regime (Naqvi & Jus,

2019). One of the first SRI indexes was launched in 1990, containing companies operating in the United States (Martini, 2021), whereas the first global SRI index was launched in 1999 (Naqvi & Jus, 2019).

The demand for sustainability has increased over time. Morgan Stanley's (2023) half-year report 2023 shows that sustainable funds' assets under management (AUM) have grown to \$3.1 trillion by the end of June 2023 compared to \$2.8 trillion at the end of year 2022. The AUM at the end of June represents 7.9% of total AUMs, and it is at a record high level. Most of the sustainable funds (89% of AUMs') are in Europe (Morgan Stanley, 2023). The sustainable funds have outperformed the traditional funds in the first half of 2023, with a 6.9% return compared to traditional funds with 3.8% (Morgan Stanley, 2023).

Figure 7 below shows how professional investors have responded to adding ESG investments to their portfolios during 2023. According to Statista's (2023) survey, half of the investors plan to add ESG investments to their portfolios during 2023, whereas 4% do not invest and plan not to make ESG investments during 2023.

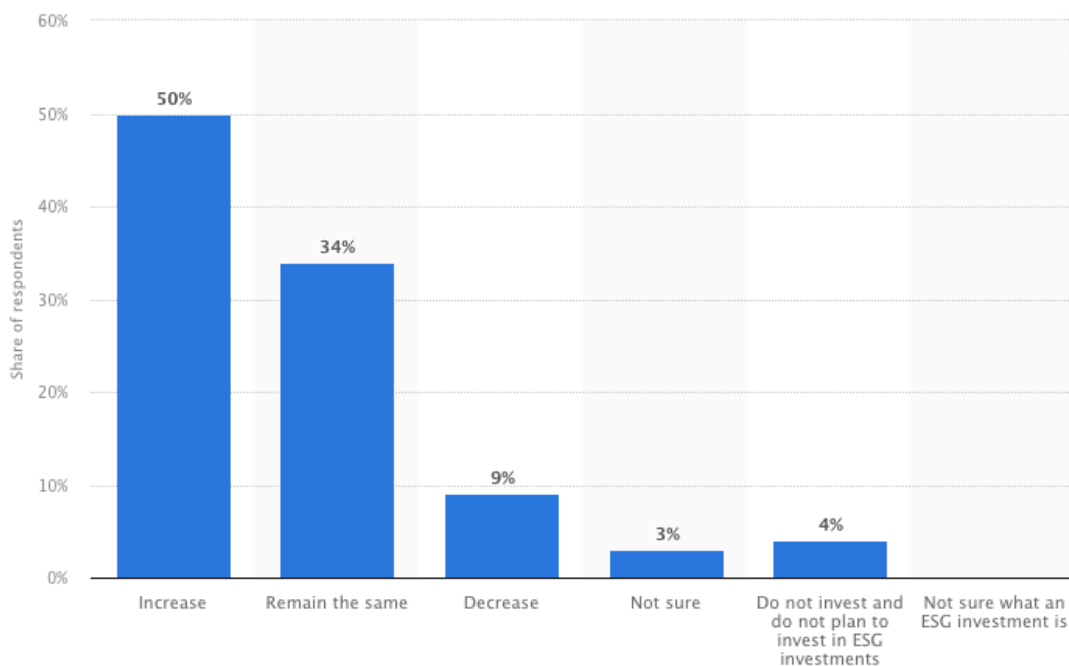


Figure 7. Survey results of ESG investments in 2023 (Statista, 2023).

4.1 Motivation of ESG Investing

ESG investing is motivated by various factors and goals, which vary between investors. Common reasons for ESG investing include ethical and moral values, long-term sustainability, risk mitigation, competitive advantage, and market demand. Individual motivations for ESG investing can vary widely, and investors may prioritize different aspects of ESG.

Amel-Zahed & Serafeim (2018) survey asset-managing and asset-owning institutions, with 652 responses. The majority of the responses were in Europe (40%) and in North America (34%). 82% of the responders use ESG information in their investment decisions, and the majority (63%) do it because they recognize that ESG information has a significant financial impact on investment performance. Other reasons behind ESG information usage, used by around 30% of the responders, are the growing market demand, ESG products being integrated into the investment organization's product strategy, a commitment to ethical responsibility, and the anticipation of its increasing significance in the near future. Conversely, for those who choose not to incorporate ESG information into their investment decision most cited reasons are the absence of stakeholder demand and the unavailability of reliable non-financial data.

These results suggest that the utilization of ESG information is predominantly influenced by financial incentives, as the main reasons are related to financial performance and lack of demand rather than ethical considerations. However, there is a greater emphasis on ethical considerations in Europe compared to the United States (Amel-Zahed & Serafeim, 2018).

Przychodzen et al. (2016) conduct a survey of fund managers' motives to incorporate ESG into investment decision-making. The study sample is smaller compared to Amel-Zahed & Serafeim (2018), with 113 responses from the US, Canada, the UK, Spain, and Poland. 41% of responses indicate that the incorporation of ESG issues significantly influences their investment decision-making.

According to a study by Przychodzen et al. (2016), fund managers are more inclined to include ESG in their investment decision-making process when they have a shorter average forecasting horizon. This indicates that they perceive ESG issues as potential risks to value creation in the short term. In addition to risk aversion, Przychodzen et al. (2016) find that fund managers view incorporating ESG into investment decisions as potentially enhancing their professional performance and potentially increasing their remuneration.

As the studies of Przychodzen et al. (2016) and Amel-Zahed & Serafeim (2018) are done by questionnaire, the results are affected significantly by what the questions contain. Przychodzen et al. (2016) concentrate more on fund managers' personal aspects when using ESG information, not what is the motivation to use ESG information. Amel-Zahed & Serafeim (2018) focus on the motivation of why investment managers use ESG information.

Park & Oh (2022) concentrate on individual investors' integration of ESG information, as previous literature mostly focuses on institutional investors. They find that individual investors are more likely to incorporate ESG information into their decision-making when they anticipate favorable financial returns and a low level of information processing. In addition, individual investors need a solid understanding of ESG management, which can be enhanced through corporate investor relations. By leveraging corporate investor relations, individual investors can better incorporate ESG information (Park & Oh, 2022).

In conclusion, while previous studies have found that financial returns are the primary motivation, it is essential to recognize that these objectives need not be mutually exclusive. As investors seek both financial returns and positive societal impact, the landscape of ESG investing continues to evolve, offering new opportunities.

5 ESG and IPO

This last theoretical framework chapter provides an overview of prior research related to ESG and IPO, and ESG and post-IPO performance. At the end of the section, the hypothesis is developed to find the answer to the research question.

5.1 Studies of ESG & IPO

Considering the growing increasing importance of ESG disclosure (Ferri et al., 2023), it is meaningful to study the effect of ESG in the initial public offering. The publication of an ESG report has the potential to mitigate information asymmetries and serve as a mechanism for transparency, and therefore, the ESG disclosure can be a significant factor for an IPO's success (Ferri et al., 2023). Investment capital is more likely to be attracted by companies that exhibit transparency in their ESG activities, given the growing emphasis placed by investors on ESG concerns (Ferri et al., 2023).

As the ESG disclosure provides additional information about the companies' potential risks and opportunities regarding non-financial issues (Ferri et al., 2023), it reduces information asymmetry, which is the ground of many theories that explain IPO underpricing. In addition, there is evidence of a positive correlation between ESG disclosure and the financial performance of companies. However, the ESG disclosure can increase costs (Fu et al., 2023).

Fu et al. (2023) study the impact of ESG disclosure and performance on the survivability of IPOs in the U.S. market from 1999 to 2016. Their findings indicate that higher ESG disclosure leads to a higher probability of IPO survival. More specifically, the companies that have disclosed earlier their ESG information have a greater likelihood of long-term viability compared to IPOs that delay the disclosure of ESG information (Fu et al., 2023; Ferri et al., 2023). The presence of a positive and statistically significant coefficient for nondisclosure implies that initial IPOs that have not published their ESG profile by the

time of their IPO are more prone to experiencing failure within a five-year period (Fu et al., 2023).

Interestingly, Fu et al. (2023) find that the primary drivers of IPO survival are the social and governance pillars rather than the environmental pillar. Similarly, Ahmad et al. (2021) find in the dynamic analysis of ESG impact on the market performance that the environmental pillar is not statistically significant.

Ferri et al., (2023) studies the impact of ESG disclosure on IPO underpricing in European markets from 2017 to 2021, when there has been a growing recognition of sustainability issues. 50% of their sample companies disclosed their ESG information prior to IPO, and the other half did not. Their findings indicate that the ESG disclosure prior to an IPO leads to a reduction in underpricing. This finding can be seen as consistent with Fu et al. (2023) finding that higher first-day returns of IPOs have a higher probability of IPO failure. Specifically, Ferri et al. (2023) find that the publication of the ESG reporting reduces IPO underpricing by 8%.

Ferri et al. (2023) findings are consistent with the study of Harasheh (2023), who study small and medium-sized companies that are listing to Borsa Italiana between the period 2009 to 2017. The scope is thus smaller, but the findings are consistent. Harasheh (2023) finds that underpricing exhibits a negative correlation with ESG rating prior to an IPO, which reduces the underpricing. However, the correlation between the post-IPO stock return and ESG variable is statistically weak. Only the year after the IPO has a statistically significant coefficient at a 10% level, but the coefficient is economically small (0.01). That indicates that over time, ESG information is incorporated into stock returns by market (Harasheh, 2023).

One explanation for reduced underpricing is that ESG disclosure provides investors with more valuable information about non-financial factors, and therefore, investors possess more comprehensive information about the company's true value and performance

(Ferri et al., 2023). For example, revealing a company's environmental policies can offer valuable information on the potential financial costs associated with environmental regulations, as well as the repercussions of climate change in the company's operations (Ferri et al., 2023). Likewise, the revelation of a corporation's social policies can offer valuable information about how the company treats its employees, conducts its supply chain operations, and engages with the community (Ferri et al., 2023). Consequently, this data can assist investors in making more knowledgeable judgments regarding the prospective long-term financial viability of a corporation.

However, Economidou et al. (2023) have the opposite view of the relationship between IPO underpricing and ESG. They study IPOs in the U.S. markets during the period from 2007-2018 and their finding is that companies who have disclosed their ESG performance prior to IPO exhibit higher underpricing due to market response. Economidou et al. (2023) argue that the market positively evaluates and responds to companies' ESG activities that are publicly available prior to IPO. As a result, this evaluation leads to an increase in the closing price and thus underpricing the issue.

Fu et al. (2023), in addition, examine the impact of ESG disclosure on the IPO long-run performance. They find that companies that have disclosed their ESG profile prior to the IPO exhibit higher buy-and-hold returns. This finding indicates that companies that do not disclose their ESG performance exhibit higher levels of downside risk in long-term holdings (Fu et al., 2023). The downside risk in long-term holdings represents the risk of potential financial loss because of declining stock price (Reber et al., 2022). The finding of Fu et al. (2023) is consistent with Reber et al. (2022) study. Reber et al. (2022) find that ESG disclosure prior to the IPO reduces the downside risk of the company aftermarket. Taking into consideration the timing of disclosure, Fu et al. (2023) find that companies that have provided longer ESG disclosure prior to IPO exhibit higher long-run performance.

Economidou et al., (2023) find a similar effect that ESG-rated IPO issuers exhibit higher performance post-IPO. They examine the market performance of new issues for a 20-day period after the IPO. The initial 20-day period following the IPO shows a statistically significant increase of 3% in buy-and-hold abnormal returns for IPO issuers that have ESG disclosure prior to IPO (Economidou et al., 2023). In addition, they find that equity issuers that have been assigned ESG ratings have a greater propensity to allocate initial public offering (IPO) funds towards activities that generate value.

5.2 Hypothesis development

To find the answer to the research question “Does the ESG disclosure affect the IPO underpricing and short-term performance after IPO?”, this thesis develops two hypotheses.

IPO underpricing is a known anomaly in the financial markets (Ritter, 1991). As discussed earlier, there are several theories explaining why IPOs are underpriced. Asymmetric information is the basis for many theories explaining the phenomena (Ritter, 2011). Before a company goes public, there are fewer requirements to disclose public information. Company insiders, for example, executives and early investors, typically have more detailed information about the company’s financial health, growth prospects, and potential risks compared to the public. Thus, IPOs are often characterized by information asymmetry.

When a company shares ESG information before the initial public offering, the transparency increases as the company provides additional information to the public (Ferri et al., 2023). That can be seen as one factor mitigating asymmetric information between insiders and outsiders. Additionally, Lowry & Schwert (2004) find that the majority of publicly available information is incorporated into the IPO final offer price. This is consistent with Ferri et al. (2023) and Harasheh (2023) studies. Their findings indicate that companies which have disclosed their ESG information before IPO, are less underpriced.

Besides reduced information asymmetry, there is a growing demand for ESG investments. According to Statista's (2023) survey, half of the investors plan to increase ESG investments in their portfolios during 2023. Companies with higher ESG disclosure are often seen as better in long-term investments, and thus, IPO investors may seek long-term value. For example, Whelan et al. (2021) find that higher ESG disclosure companies generate excess returns compared to conventional investments, especially for a long-term horizon. Additionally, the market often views higher ESG performance positively. These can potentially reduce the need for underpricing. With previous research, mitigated information asymmetry, and the growing demand for ESG investments, the first hypothesis is:

H_1 : Higher ESG disclosure reduces underpricing.

In addition to IPO underpricing, the long-run performance of IPOs is a widely studied phenomenon in finance (Ritter, 1991). According to Ritter (1991), IPO underpricing is rather a short-run phenomenon, as in the long run, IPOs are rather overpriced. However, Beaulieu & Mrissa Bouden (2020) find that the majority of IPOs do not underperform compared to their benchmarks when returns are adjusted for firm-level idiosyncratic risks.

Fu et al. (2023), Ferri et al. (2023), Reber et al. (2022), and Economidou et al. (2023) study ESG and post-IPO performance. All of these studies yield similar findings, suggesting that an ESG rating before IPO is associated with a reduction in downside risk in the aftermarket. Moreover, Economidou et al., (2023) find that the buy-and-hold returns increase 3% for IPO issuers that have ESG disclosure before IPO.

This thesis studies whether the higher ESG disclosure leads to higher short-term performance after IPO. All the IPOs in the sample have ESG ratings and thus, we expect that it has a positive effect on short-term performance. Additionally, following Beaulieu &

Mrissa Bouden (2020), we expect that higher ESG disclosure mitigates the idiosyncratic risks related to ESG issues. These leads to the second hypothesis of the study:

H₂: Higher ESG disclosure leads to higher short-term performance.

6 Data and Methodology

This chapter describes the data used in the study and the methodology used to test the hypotheses. As presented in the beginning, the study aims to find out if ESG disclosure reduces underpricing and whether ESG disclosure positively affects short-term performance after an IPO. The first part of this chapter reviews the data, followed by descriptive statistics. The last part presents the methodology.

6.1 Data

The data of this study is collected from Bloomberg Finance L.P., accessed on 2023-10, except the company age and total assets are collected from the Orbis database, accessed on 2023-10. The data includes the initial public offerings in Nordic countries stock exchanges between 2016 and 2021. The total number of IPOs in Nordic markets during the study period is 581. The data is restricted to the initial public offerings of common shares, and which effective date is between this period. The period is selected on the rising interest of ESG and the availability to track IPO performance post-IPO for one year.

The Nordic countries include Denmark, Finland, Iceland, Norway, and Sweden. According to Bloomberg Finance L.P., Denmark exchanges include Copenhagen, Dansk OTC, and First North Denmark. Finland exchanges include Helsinki and First North Finland. Iceland exchanges include Reykjavik and First North Iceland. Norway exchanges include Oslo and Norwegian OTC. Sweden exchanges include Stockholm, First North Stockholm, Nordic Growth Market, and Spotlight Stock Market.

The Nasdaq First North exchanges are a growth platform for early-stage companies (Nasdaq, n.d.). The market is standardized as an EU SME Growth market with lighter listing requirements compared to main markets, like Helsinki Exchange or Stockholm Exchange. (Nasdaq, n.d.). This means, for example, that there is no requirement for mini-

imum market capitalization and no requirement for IFRS accounting standards. This exchange enables smaller companies to access capital and develop and expand their business (Nasdaq, n.d.). According to Nasdaq (n.d.), there are over 550 companies trading in the First North exchange, and on average, more than five companies transfer to the Main Market yearly.

There are 581 announced IPOs in Nordic Markets with an effective date between 2016 and 2021 (Bloomberg Finance L.P.). 561 of these are at stage “trading,” which means that the IPO has gone to market during the study period. However, this does not mean that the stock is still publicly traded. There are IPOs during the study period, that for example the company is acquired and is not publicly traded anymore. 1 of the announced IPOs is still pending, 5 are postponed, and 14 IPOs are withdrawn after the announcement and before the start of trading. Table 1 shows the IPOs spreading over the years and the Nordic countries during the study period. After this figure, the study concentrates on the Nordic markets overall and does not separate the information between the countries.

Table 1. Initial Public Offerings in Nordic Markets yearly, from 2016 to 2021.

	Denmark	Finland	Iceland	Norway	Sweden	Total
2016	3	8	2	3	66	82
2017	5	10	0	16	73	104
2018	7	14	1	10	39	71
2019	2	5	0	8	17	32
2020	11	4	0	39	22	76
2021	22	23	3	51	117	216
Total	50	64	6	127	334	581

Measured by the total value of the initial public offerings, the biggest industries are software, commercial services, computers, electric, and real estate (Bloomberg Finance L.P.). The total value of the initial public offering from 2016 to 2021 is 46.8 billion USD (Bloomberg Finance L.P.). 59 different industries have IPOs during the study period, which gives a diverse sample industry-wise. Figure 8 shows the largest industries and the total value of IPOs in the industry during the study period.

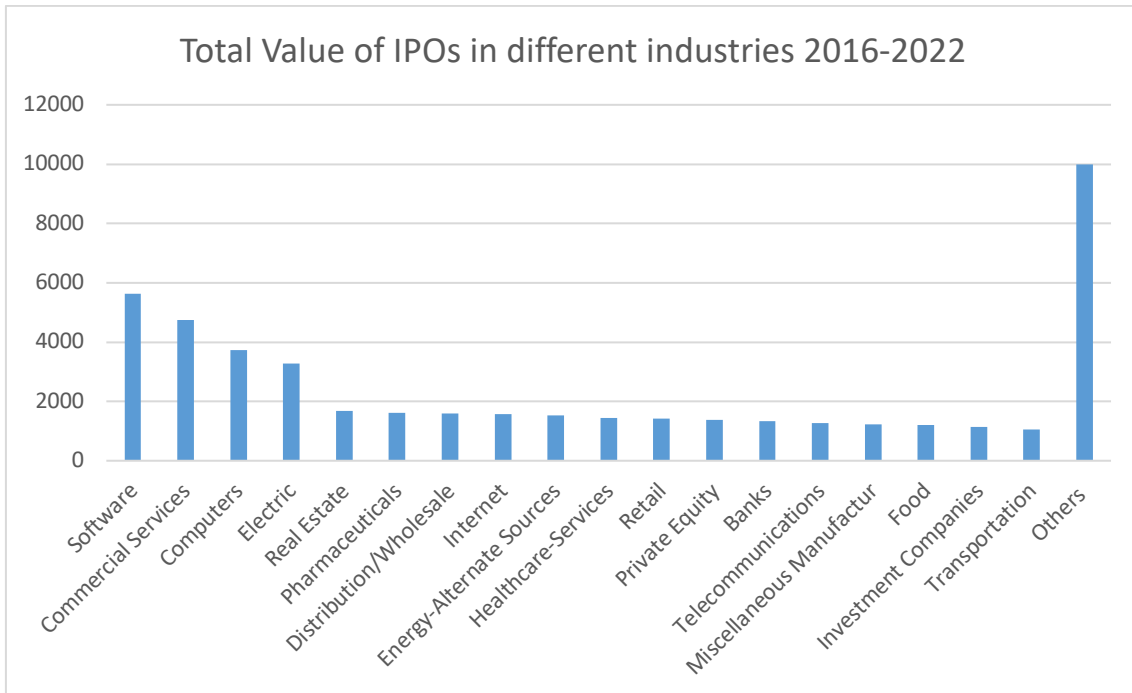


Figure 8. Total Value of IPOs in different industries during the study period.

This study uses the Bloomberg ESG scores. Bloomberg's ESG datasets cover 15,000 companies in over 100 countries. That coverage is nearly 93% of the global equity market capitalization. Bloomberg's objective is to include at least 80% of a company's operations and employees in its scoring. Bloomberg has won several awards, for example, as best ESG data provider and Best Overall ESG provider in 2023 (Bloomberg Finance L.P.).

Bloomberg has several different metrics that it considers when calculating ESG Scores. The topics under consideration are similar to those discussed in Chapter 3. In the environmental score, the metrics concentrate, for example, on Greenhouse Gases, Carbon Dioxide, Energy, Waste, and Water. In Social Score, the metrics concentrate, e.g., Employee Diversity, Gender Pay Gap, Safety, Supply Chain and Human Rights & Modern Slavery. In the Governance score, the concentration is, for example, on Board Structure, Independence, Board & Executives diversity, Board Meetings, and different kinds of committees. Figure 9 illustrates what kind of metrics Bloomberg uses when calculating individual ESG scores.

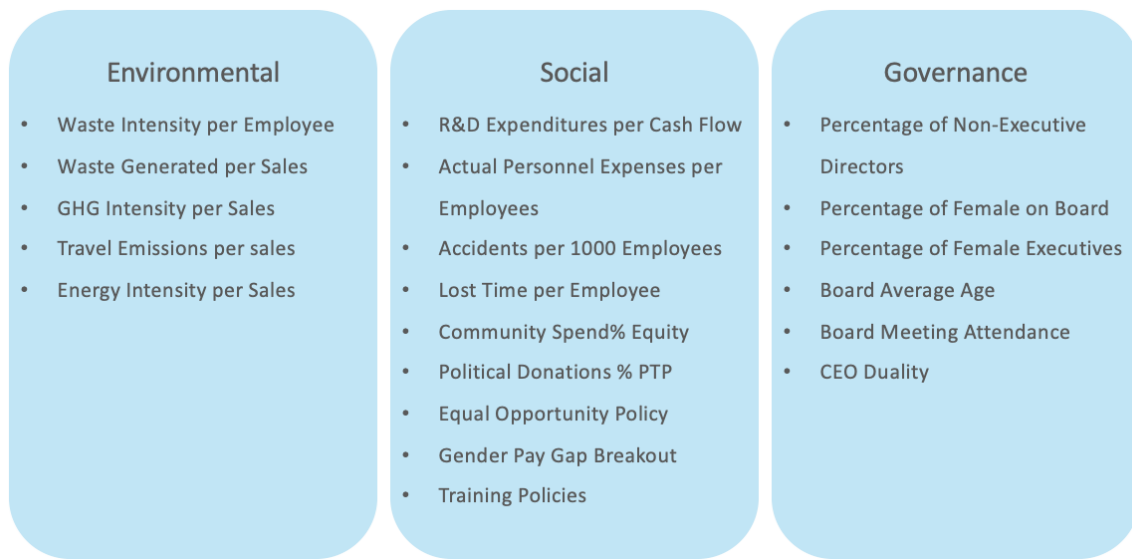


Figure 9. Bloomberg ESG pillar score calculation metrics.

One major limitation of the study is that not all of the Initial Public Offer companies have obtained ESG scores during the period of IPO. This reduces the sample to 107 companies. In addition, the companies that have withdrawn the IPO before it has gone to market are excluded. The majority of the study sample companies got the first ESG rating in the year of the initial public offering. 21 companies in the study sample got the first ESG rating a year after the IPO year. Due to that, this study uses the ESG score a year after listing to get more similar results for all companies.

6.2 Descriptive Statistics

Before methodology, this part will go through the different descriptive statistics of study variables. Study variables are gone through in more detail in the next section. In descriptive statistics, the logarithmic transformations are not done to control variables. The four following tables give an overview of the characteristics and structure of the data. The mean and median measure the central tendency of the dataset, and standard deviation and maximum and minimum values measure the spread. The 25th percentile, median, and the 75th percentile shows the distribution across different quartiles. Table 2 presents descriptive statistics for the dependent variables used in the regression analysis.

Table 2. Descriptive statistics for dependent variables.

Dependent variables	Mean	Std. Dev	25th Pctl	Median	75th Pctl	Max	Min
Underpricing	0.102	0.201	0	0.041	0.154	1.464	-0.277
1-week return	0.099	0.183	-0.006	0.060	0.196	0.884	-0.333
1-month return	0.133	0.306	0	0.070	0.218	1.645	-0.455
3-month return	0.213	0.572	-0.033	0.114	0.314	4.859	-0.448
1-year return	0.117	0.484	-0.118	0	0.254	2.127	-0.727

The first dependent variable, underpricing, has a mean of 0.102, which shows that the average underpricing and the average first-day return is 10.2%. However, when looking at the median, which is less affected by outliers, the equivalent is 4.1%. All the dependent variable means are positive and around 10%, except the 3-month return, where the mean is 21.3%. The median values are smaller, which shows that there are outliers in every variable dataset. Additionally, the standard deviations are relatively high, especially in 3-month and 1-year returns. These indicate a relatively high degree of variability in the underpricing of IPOs. The minimum of each dependent variable indicates, in addition, overpricing in the study sample. The range in each dependent variable range is large, with the highest being in 3-month returns, where the minimum return is -44.8% and the highest is 486%.

Descriptive statistics for dependent variables generally show that this study sample has underpricing. Additionally, the short-term performance after the IPO is positive, measured by mean and median. Table 3 shows descriptive statistics for the independent variables, which are ESG variables.

Table 3. Descriptive statistics for independent variables.

Independent variables	Mean	Std. Dev	25th Pctl	Median	75th Pctl	Max	Min
ESG overall	29.092	12.279	22.575	30.140	36.265	61.640	4.910
Environmental	14.492	14.701	0.955	10.540	23.830	60.310	0
Social	16.329	8.945	10.370	15.990	20.480	43.230	2.570
Governance	56.351	21.504	43.005	58.970	74.200	89.920	7.250

The descriptive statistics of ESG variables show relatively high standard deviations, and the range of the dataset is large, indicating a high variability in the scores. However, the mean and median in all independent variables are close to each other, which indicates

that there might not be many outliers in the dataset. The mean of the environmental score and social score is significantly lower compared to the governance score, thus having a different distribution.

One explanation for lower environmental and social scores is negativity bias. People prioritize and utilize negative information to a greater extent than positive information (Vaish et al., 2008). However, the governance scores of Nordic countries tend to be more on the higher side oppositely to environmental and social scores. The Nordic corporate governance model is based on corporate governance codes, and it has its own specialties (Lekvall & Gilson, 2014). The Nordic companies tend to be transparent about their operations and the codes go above legislation. Companies need to explain if they are not following the codes, which increases transparency and moves companies to operate higher governance level (Lekvall & Gilson, 2014).

Table 4. Descriptive statistics for control variables.

Control variables	Mean	Std. Dev	25th Pctl	Median	75th Pctl	Max	Min
Year 2021	0.430	0.497	0	0	1	1	0
Age	17.009	25.782	4.00	8.00	18.00	172.00	0
Size	15587187	129351471	114915.5	278239.0	771518.5	1326869957	17.708

The descriptive statistics for control variables in Table 4 show that the mean age of the company is 17 years, however, the range is between 0 to 172. The median age is 8 years. This shows that half of the IPOs are relatively young companies, as half of the IPOs are 8-year-old or younger companies. Similar to age, the total assets range is wide, from 17.708 to 1,326,869,957. Thus, the logarithmic transformation is done before regressions. During the study period, there have been, for example, IPOs of banks with large assets and old companies. This shows that not all the IPOs are young, even though the minimum value is 0. The logarithmic transformation of age and total assets is done before regression analysis.

Table 5. Descriptive statistics for top and bottom ESG quantiles.

	Top Quantile			Bottom Quantile		
	Mean	Max	Min	Mean	Max	Min
Underpricing	0.093	0.535	-0.036	0.064	0.328	-0.167
1-week return	0.112	0.620	-0.100	0.063	0.386	-0.333
1-month return	0.146	0.908	-0.143	0.007	0.366	-0.455
3-month return	0.227	1.000	-0.198	0.049	0.711	-0.448
1-year return	0.246	1.724	-0.514	0.014	1.507	-0.727
ESG overall	44.207	61.640	36.270	13.179	22.530	4.910
Environmental	30.861	60.310	9.600	3.867	33.680	0.000
Social	25.727	43.230	14.510	7.281	17.110	2.570
Governance	75.912	89.920	51.410	28.331	55.900	7.250
Year 2021	0.333	1.000	0.000	0.630	1.000	0.000
Age	21.926	114.000	0.000	14.296	56.000	0.000
Size	58504905	1326869957	71546	1713358	40075575	17.708

To get more informative descriptive statistics, in Table 5, companies are divided into the top 25% and the bottom 25% based on their ESG overall scores. Both of these samples contain 27 IPOs. Underpricing for top-quartile companies is slightly higher, 9.3%, compared to bottom quartile, 6.4%. However, after the first-day return, the top quartile companies' returns turn out to be higher. This is similar to Economidou et al. (2023) study, where they find that companies that have disclosed ESG information prior to IPO exhibit higher underpricing due to market response. This leads to a higher closing price on the first day, and thus, the underpricing is higher. These descriptive statistics support only the second hypothesis that higher ESG disclosure leads to higher short-term performance. The mean age of a company in the bottom quartile is lower, 14.3, compared to the top 22.0 years. The overall sample mean age goes between these two, 17.0 years. In addition, the total assets mean in top quartile companies is significantly larger, 58,504,905,000, compared to the bottom quartile, 1,713,358,000.

Figure 10 presents the correlations between the study variables. For readability, it is presented as a heat map correlation matrix. A darker color in the matrix indicates a higher correlation, while a red shade indicates a positive correlation and a blue shade a negative correlation.

	Underpricing	1-week return	1-month return	3-month return	1-year return	ESG overall	Environmental	Social	Governance	Year 2021	Ln(Age+1)	Ln(Total Assets)
Underpricing	1											
1-week return	0,746	1										
1-month return	0,552	0,779	1									
3-month return	0,293	0,481	0,734	1								
1-year return	0,099	0,228	0,221	0,364	1							
ESG overall	0,036	0,044	0,127	0,073	0,127	1						
Environmental	-0,007	0,034	0,037	-0,020	0,009	0,764	1					
Social	0,007	-0,021	0,099	0,111	-0,029	0,830	0,703	1				
Governance	0,064	0,060	0,151	0,093	0,224	0,845	0,332	0,525	1			
Year 2021	0,045	-0,002	-0,079	-0,150	-0,297	-0,249	-0,172	-0,197	-0,227	1		
Ln(Age+1)	-0,212	-0,201	-0,221	-0,143	-0,049	0,116	0,146	0,114	0,052	0,024	1	
Ln(Total Assets)	-0,053	-0,053	-0,059	-0,139	0,016	0,559	0,417	0,510	0,460	-0,218	0,032	1

Figure 10. Correlation matrix of variables.

Generally, the correlations are fairly weak. The correlations are generally higher between the short-term performance measures, especially underpricing and 1-week return, 1-week return and 1-month return, and 1-month return and 3-month return. 1st-year return correlations between shorter-term returns are weakly correlated. The individual ESG pillars are weakly correlated with each other, but the correlation to ESG overall is high. This indicates that higher disclosure to one pillar does not mean good performance in another pillar. As seen in descriptive statistics earlier, the especially the mean governance score differs greatly from environmental and social disclosure.

Companies' age and size are fairly weak but negatively correlated to short-term performance, except for size and first-year return. Age has a higher correlation compared to size in short-term performance measures. This indicates that underpricing in younger companies tends to be slightly higher, but short-term performance is slightly better compared to older companies. Size and ESG scores have a higher positive correlation. This indicates that larger companies tend to have higher ESG disclosure.

6.3 Methodology

This study uses the Ordinary Least Squares (OLS) regression model. The study tests the impact of each ESG pillar and ESG overall score on underpricing and short-term performance. The used variables and the regression model are presented in the following subchapter before the results.

6.3.1 Dependent variables

The dependent variables of this study are short-term stock price returns. As previous literature shows, the first-day return tends to be positive. This study divides short-term returns into first-day (underpricing), 1-week, 1-month, 3-month, and 1-year returns. This enables us to study the underpricing in the short term rather than limiting it to the first day. Returns are defined as follows:

$$\text{Underpricing} = \frac{\text{Closing price on the first day} - \text{Offer price}}{\text{Offer price}} \quad (1)$$

$$1 - \text{week} = \frac{\text{Closing price on the first week} - \text{Offer price}}{\text{Offer price}} \quad (2)$$

$$1 - \text{month} = \frac{\text{Closing price on the first month} - \text{Offer price}}{\text{Offer price}} \quad (3)$$

$$3 - month = \frac{\text{Closing price on the third month} - \text{Offer price}}{\text{Offer price}} \quad (4)$$

$$1 - year = \frac{\text{Closing price on the first year} - \text{Offer price}}{\text{Offer price}} \quad (5)$$

6.3.2 Independent and Control variables

The independent variables are the ESG variables obtained from Bloomberg L.P. This study uses the ESG overall score and the pillars of Environmental, Social, and Governance independently. This is done to investigate whether some pillar has a greater impact on underpricing and short-term performance. In addition, as presented earlier, the scores between E, S, and G differ significantly.

The control variables for the study are selected based on the previous literature, according to what can be explanatory factors for IPO underpricing and for short-term performance. Widely used control variables in IPO underpricing and IPO performance studies are company size and company age. For example, Ferri et al. (2023) find that larger companies tend to be associated with lower risk, which leads to lower levels of underpricing. Total assets in the year of IPO describe the size of the company. Similar in size, older companies are typically less underpriced (Roosenboom, 2012). Before regressions, logarithmic transformations are done to size and age variables.

Year 2021 is used as a dummy variable in the study. Ritter (1991), Helwege & Liang (2004), and Lin et al. (2021) find that hot market issues tend to have lower performance. The year 2021 market conditions can be seen as hot, as 37% of the study period IPOs are issued during the year 2021. Figure 11 shows the control variables and how those are formed.

Variable	Definition
Year_2021	The dummy variable equals 1 if the issue year is 2021
Age	$\ln(\text{IPO year} - \text{foundation year} + 1)$
Size	$\ln(\text{Total assets})$

Figure 11. Control variables.

6.3.3 Regression models

The regression models in this study are used to model and examine the relation between dependent variables and independent- & control variables. The regression models combine the collected study sample, which is discussed earlier. With regression models, this study aims to find the strength of the relation between underpricing and short-term performance of IPOs and ESG disclosure.

This study uses multiple regression, as there are several independent variables and control variables. The method OLS regression. For testing the first hypothesis, ESG impact on IPO underpricing, the regression model is as follows:

Underpricing

$$\begin{aligned}
 &= \alpha_i + \beta_1 ESGOverall_i + \beta_2 Environmental_i + \beta_3 Social_i \\
 &+ \beta_4 Governance_i + \beta_5 Year2021_i + \beta_6 Age_i + \beta_7 Size_i + \varepsilon_i \quad (6)
 \end{aligned}$$

where α_i is a constant term, independent ESG terms are from the Bloomberg database ESG scores of companies for company i , and control variables for company i . Age and size are natural logarithmic of the values. For the short-term performance, the regression model is similar. The dependent variable short-term performance changes from 1-week, 1-month, 3-month, and 1-year performance.

Short – term performance

$$\begin{aligned} &= \alpha_i + \beta_1 ESGOverall_i + \beta_2 Environmental_i + \beta_3 Social_i \\ &+ \beta_4 Governance_i + \beta_5 Year2021_i + \beta_6 Age_i + \beta_7 Size_i + \varepsilon_i \end{aligned} \quad (7)$$

7 Results

This study aims to find whether the ESG disclosure affects IPO underpricing and short-term performance. The regression analysis is done to test the hypotheses and find answer to the research question. The dependent variables change; first, the regression is run with underpricing as the dependent variable and then with the short-term performance metrics presented previously.

7.1 Underpricing regression results

To test the first hypothesis, the OLS regressions are run using underpricing as a dependent variable. The effect of ESG disclosure is tested on both the total ESG and for each pillar separately. Table 6 presents the regression results. The first column regression uses all of the ESG variables, and the latter columns test the total ESG and ESG pillars separately.

In the first regression, all of the ESG variables are statistically significant at the 5% level. The coefficient of ESG overall is positive, but the individual ESG pillars appear negative. For ESG overall, a one-unit increase in ESG score is associated with an increase in Underpricing by 14.13 units. However, for the individual ESG pillars, a one-unit increase in each score is associated with a decrease in underpricing of approximately 4.7 units. In the regressions where the dependent variable is only the ESG overall or independent pillars, none of the variables are statistically significant at the 10% level.

For control variables, age is only a statistically significant variable at the 5% level in all regressions. The year 2021 or the size are not statistically significant at the 10% level. In all regressions, the age has a similar negative coefficient, around -0.04. This indicates that younger companies tend to be slightly more underpriced.

The R-square in all models is relatively low, indicating that underpricing is a result of other variables than independent or control variables. Additionally, in all regressions, the F-statistics indicate that the model is not statistically significant at the 10% level.

Table 6. Regression results with underpricing as the dependent variable.

	<i>Dependent variable:</i>				
	Underpricing				
	(1)	(2)	(3)	(4)	(5)
ESG Overall	14.133** (6.328)	0.002 (0.002)			
Environmental	-4.706** (2.108)		0.001 (0.001)		
Social	-4.703** (2.106)			0.002 (0.003)	
Governance	-4.721** (2.115)				0.001 (0.001)
Year 2021	0.029 (0.040)	0.025 (0.040)	0.019 (0.040)	0.020 (0.040)	0.024 (0.040)
Age	-0.044** (0.018)	-0.043** (0.018)	-0.041** (0.183)	-0.042** (0.018)	-0.041** (0.018)
Size	-0.010 (0.010)	-0.010 (0.010)	-0.005 (0.009)	-0.007 (0.010)	-0.008 (0.010)
Constant	0.237* (0.124)	0.244** (0.121)	0.243* (0.125)	0.242* (0.123)	0.219* (0.121)
F Statistic	1.72	1.68	1.39	1.44	1.69
Observations	107	107	107	107	107
R ²	0.108	0.062	0.052	0.054	0.062
Adjusted R ²	0.045	0.025	0.014	0.016	0.026
RMSE	0.196	0.199	0.200	0.199	0.198

Significance levels: *** at 1% ($p < 0.01$), ** at 5% ($p < 0.05$), and * at 10% ($p < 0.10$).

7.2 Short-term performance regression results

To test the second hypothesis, the OLS regressions are run using different short-term performance measures as a dependent variable. Additionally, the effect of ESG disclosure is tested on both the total ESG and for each pillar separately. Similar to underpricing, the first column regression contains all of the ESG variables together, followed by ESG total and independent ESG pillars tested separately.

Table 7 below presents the results with the dependent variable 1-week return. Similar to regression with underpricing, in the first regression, the ESG overall has a positive coefficient, but the individual pillars' coefficients are negative. The coefficients are smaller than in underpricing, but the results are not statistically significant at the 10% level. None of the 5 regressions have a statistically significant at the 10% level coefficients in ESG variables. The control variables have similar explanatory power in all regressions as in underpricing; only age has a statistically significant at the 5% level small negative coefficient. Additionally, none of the regression models are statistically significant at a 5% level, and the explanatory powers are low.

Table 7. Regression results with a 1-week return as the dependent variable.

	<i>Dependent variable:</i>				
	1-week return				
	(1)	(2)	(3)	(4)	(5)
ESG Overall	4.708 (5.883)	0.002 (0.002)			
Environmental	-1.566 (1.959)		0.001 (0.001)		
Social	-1.569 (1.958)			0.001 (0.002)	
Governance	-1.572 (1.967)				0.001 (0.001)
Year 2021	0.006 (0.037)	0.004 (0.037)	0.000 (0.037)	-0.002 (0.037)	0.003 (0.037)
Age	-0.037** (0.017)	-0.037** (0.017)	-0.036** (0.017)	-0.035** (0.017)	-0.035** (0.017)
Size	-0.009 (0.009)	-0.010 (0.009)	-0.007 (0.009)	-0.005 (0.009)	-0.008 (0.001)
Constant	0.240** (0.115)	0.244** (0.111)	0.254** (0.114)	0.234** (0.113)	0.221** (0.110)
F Statistic	1.07	1.50	1.37	1.16	1.44
Observations	107	107	107	107	107
R ²	0.070	0.056	0.051	0.044	0.053
Adjusted R ²	0.004	0.018	0.014	0.006	0.016
RMSE	0.183	0.181	0.182	0.182	0.182

Significance levels: *** at 1% ($p < 0.01$), ** at 5% ($p < 0.05$), and * at 10% ($p < 0.10$).

Table 8 shows the regression results with the dependent variable 1-month return. In the first regression, the ESG coefficients change to be negative in ESG overall, and individual

pillars negative, which is conversely to underpricing and one-week return. However, the results are not statistically significant at the 10% level. In the second, fourth, and fifth regressions, the ESG variables have statistically significant coefficients. However, in economic terms, the coefficients are meaningless, however positive. This indicates that ESG overall, social, and governance levels have some minor positive effect on 1-month return.

In all regressions, age has a statistically significant negative coefficient. Additionally, size has a statistically significant negative coefficient in the first and second regressions. The fourth and fifth regressions F-statistics indicate, that the models are statistically significant respectively at 10% and 5% levels.

Table 8. Regression results with a 1-month return as the dependent variable.

	<i>Dependent variable:</i>				
	1-month return				
	(1)	(2)	(3)	(4)	(5)
ESG Overall	-5.421 (9.611)	0.006** (0.003)			
Environmental	1.806 (3.201)		0.002 (0.002)		
Social	1.809 (3.199)			0.007* (0.004)	
Governance	1.814 (3.211)				0.003** (0.002)
Year 2021	-0.034 (0.061)	-0.033 (0.060)	-0.049 (0.061)	-0.043 (0.060)	-0.036 (0.060)
Age	-0.067** (0.028)	-0.070** (0.027)	-0.066** (0.028)	-0.068** (0.027)	-0.065** (0.027)
Size	-0.028* (0.015)	-0.028* (0.015)	-0.015 (0.014)	-0.022 (0.015)	-0.023 (0.014)
Constant	0.439** (0.188)	0.468** (0.181)	0.464** (0.188)	0.478** (0.184)	0.399** (0.180)
F Statistic	1.78	2.93	1.85	2.44*	2.79**
Observations	107	107	107	107	107
R ²	0.112	0.103	0.068	0.087	0.099
Adjusted R ²	0.049	0.068	0.031	0.052	0.063
RMSE	0.298	0.295	0.301	0.298	0.296

Significance levels: *** at 1% (p<0.01), ** at 5% (p<0.05), and * at 10% (p<0.10).

Table 9 presents the results with a dependent variable 3-month return. Similar to the 1-month return, the first regression has a negative coefficient to ESG overall and positive to individual pillars. However, as in all short-term regressions, none of the ESG variables are statistically significant in the first regression. Additionally, similar to the 1-month return, the second, fourth, and fifth regressions have statistically significant ESG variable coefficients. The coefficients are positive but, in economic terms, fairly small.

There is a change in the control variables compared to previous, different dependent short-term variable regressions. All of the 3-month return regressions have statistically significant, negative size coefficients. In economic terms, the coefficients are small. Only the fourth regression has a statistically significant negative age coefficient compared to the previous ones, where age has been statistically significant in all regressions with different variables. This indicates that three months after IPO, age does not have statistically significant explanatory power in returns. Additionally, in the third and fourth regressions, the year 2021 has negative coefficients.

Using the 3-month return as a dependent variable, all of the models are statistically significant at least 10% level. Additionally, the R-squared of all models, except the fifth, is slightly higher than in previous regressions with different dependent variables. This indicates that this model has slightly more explanatory power compared to the previous.

Table 9. Regression results with a 3-month return as the dependent variable.

	<i>Dependent variable:</i>				
	3-month return				
	(1)	(2)	(3)	(4)	(5)
ESG Overall	-12.917 (17.718)	0.010* (0.005)			
Environmental	4.296 (5.901)		0.002 (0.004)		
Social	4.319 (5.897)			0.016** (0.007)	
Governance	4.319 (5.920)				0.005* (0.003)
Year 2021	-0.183 (0.112)	-0.179 (0.112)	-0.207* (0.113)	-0.186* (0.110)	-0.185 (0.112)
Age	0.077 (0.051)	-0.083 (0.051)	-0.075 (0.052)	-0.085* (0.050)	-0.075 (0.506)
Size	-0.076*** (0.028)	-0.072** (0.028)	-0.049* (0.027)	-0.074*** (0.027)	-0.068** (0.027)
Constant	1.054*** (0.347)	1.094*** (0.339)	1.058*** (0.352)	1.157*** (0.339)	0.988*** (0.338)
F Statistic	2.26**	2.87**	2.02*	3.34***	2.71**
Observations	107	107	107	107	107
R ²	0.138	0.101	0.073	0.116	0.096
Adjusted R ²	0.077	0.066	0.037	0.081	0.061
RMSE	0.550	0.553	0.562	0.549	0.555

Significance levels: *** at 1% ($p < 0.01$), ** at 5% ($p < 0.05$), and * at 10% ($p < 0.10$).

Table 10 below shows the regression results with the dependent variable 1-year return. The ESG coefficients are similar to 1-month and 3-month results with negative ESG overall and positive individual ESG pillars. However, the dependent variable 1-year return follows the previous short-term regressions, and none of the ESG variables are statistically significant at the 10% level. The only statistically significant ESG variable is in the fifth regression, where the coefficient is positive but, in economic terms, small. These indicate that governance is the only pillar that has a statistically significant, small positive effect on one-year returns.

Year 2021 is the only statistically significant coefficient in all models. The coefficient is in all regressions negative. This indicates that IPOs that are done during 2021 have a negative impact on one-year performance. Similar to a 3-month return, the overall model is statistically significant at least 5% level. The R squared is also higher.

Table 10. Regression results with a 1-year return as the dependent variable.

	<i>Dependent variable:</i>				
	1-year return				
	(1)	(2)	(3)	(4)	(5)
ESG Overall	-6.469 (14.757)	0.005 (0.005)			
Environmental	2.157 (4.915)		-0.001 (0.003)		
Social	2.139 (4.911)			-0.004 (0.006)	
Governance	2.168 (4.931)				0.005** (0.002)
Year 2021	-0.275*** (0.093)	-0.281*** (0.095)	-0.300*** (0.094)	-0.306*** (0.094)	-0.268*** (0.093)
Age	-0.016 (0.042)	-0.024 (0.043)	-0.017 (0.043)	-0.015 (0.043)	-0.023 (0.042)
Size	-0.019 (0.024)	-0.024 (0.024)	-0.009 (0.022)	-0.002 (0.023)	-0.031 (0.022)
Constant	0.305 (0.289)	0.456 (0.286)	0.404 (0.294)	0.379 (0.289)	0.385 (0.279)
F Statistic	2.75**	2.92**	2.60**	2.74**	3.93***
Observations	107	107	107	107	107
R ²	0.162	0.103	0.093	0.097	0.134
Adjusted R ²	0.104	0.068	0.057	0.062	0.100
RMSE	0.458	0.467	0.470	0.469	0.459

Significance levels: *** at 1% ($p < 0.01$), ** at 5% ($p < 0.05$), and * at 10% ($p < 0.10$).

The different signs in ESG Overall and independent variables in the regressions may indicate that as the overall ESG is conducted for the individual pillars, not all are positively correlated with the dependent variable. That is also seen in the correlation matrix in Figure 10, where only ESG overall and governance have only positive correlation to dependent variables. Environmental and social pillars' correlations to dependent variables change between positive and negative. Additionally, the overall ESG score assessment is

not publicly available from Bloomberg L.P. This can lead to different signs when individual pillars are regressed against the dependent variable.

None of the short-term regressions has a statistically significant coefficient in the environmental pillar. Additionally, the statistically significant coefficients in all ESG variables are, in economic terms, small. This suggests that the effect of ESG disclosure level does not have explanatory power on short-term performance after IPO.

8 Discussion and Conclusions

The last chapter concludes the study and discusses the empirical results. In the last part of the chapter, the limitations of the study and the suggestions for future research are presented.

8.1 Discussion

The IPO underpricing, IPO short-term performance, and ESG effect on companies' financial performance are widely researched topics in finance. However, the effect of ESG disclosure level on IPO underpricing and short-term performance is less studied. There is research around ESG and IPOs, but the previous research concentrates more on whether the ESG disclosure before IPO affects underpricing and short-term performance, not does the ESG disclosure level plays a significant role. Thus, this thesis aims to find an answer, does the ESG disclosure level affect the IPO underpricing and short-term performance after IPO. ESG has grown in popularity in recent years, and this growth seems to continue. Due to that, it is meaningful to study how ESG disclosure impacts the IPO context.

To find the answer to the research question, this thesis has two hypotheses. The first hypothesis suggests that higher ESG disclosure reduces underpricing, whereas the second hypothesis suggests that higher ESG disclosure leads to higher short-term performance. The empirical results of this thesis offer mixed results.

The first model includes individual pillars and ESG overall disclosure in all regressions with different dependent variables. In these first model regressions, the ESG overall score behaves differently than individual pillars. The ESG overall score is not calculated by adding up the individual ESG pillars, but the overall ESG method is not publicly available. It is meaningful to look at each pillar independently, as we do not have the overall

ESG disclosure calculations available. Additionally, regressing each pillar separately could reveal whether, in the Nordic markets, some pillars are more significant.

The study presents evidence that ESG disclosure level matters in IPO underpricing. Results show that in the first regression, environmental, social, and governance pillars reduce underpricing. However, when testing each pillar separately, none of the pillars have enough explanatory power to the underpricing. The evidence is related to Fu et al. (2023), Ferri et al. (2023), and Harasheh (2023), whose studies find that ESG rating before IPO reduces underpricing. These results support the first hypothesis.

Further, the only statistically significant control variable in underpricing is age. Age has a negative coefficient, suggesting that younger companies tend to be more underpriced. As the previous literature suggests, many studies use age as a control variable, as younger companies tend to be more underpriced. However, the coefficient in economic terms is small.

When looking at the short-term performance after the IPO, the results do not support the second hypothesis. At the 1-week level, none of the ESG variables are statistically significant. At the 1-month and 3-month levels, ESG Overall, Social, and Governance pillars have statistically significant coefficients. However, in economic terms, the coefficients are small but positive. At the 1-year level, only the governance pillar has a statistically significant small positive coefficient. These findings are consistent with Fu et al. (2023) who find that the social and governance pillars affect IPO survival, but the environmental pillar has a weak effect.

The findings that the ESG variables do not have a statistically significant impact on post-IPO performance are consistent with Harasheh (2023). He studied whether the ESG disclosure prior to IPO affects underpricing and post-IPO performance, and the findings indicate that the post-IPO performance is not affected by the ESG variables. Additionally, this thesis's findings of short-term effects are consistent with Lowry & Schwert (2004).

They find that the majority of public information is incorporated into the IPO offer price. Thus, when the majority of public information, which ESG information is, is incorporated into the offer price, it should not affect the short-term performance after the IPO.

8.2 Limitations and suggestions for future research

A major limitation of this study is the data sample. The ESG disclosure scores for a year prior to listing, a year of listing, or a year after listing were not available in the Bloomberg database. The ESG scores were available for 107 companies, whereas the total of initial public offerings between study periods in Nordics is 581. This may lead to sample selection bias.

Another limitation related to ESG is the reliability of ESG scores. As discussed earlier, there are no generally accepted methods for ESG metrics and due to that, the reliability of ESG scores cannot be fully trusted. The rating companies can emphasize what they believe is important and neglect information.

The study period is from 2016 to 2021, which, in addition, brings limitations for the study. The market conditions have differed between the periods; for example, in 2020, COVID-19 escalated and affected the general market performance. In addition, this study does not consider event-specific factors. There can have been company-related news that affects the performance after the IPO and unanticipated occurrences that arise during the period, such as COVID-19.

For future research, it is meaningful to consider the limitations of this study. There are several ESG data providers, and ESG considerations and ratings are developing all the time. Additionally, it would be meaningful to consider the effects of company-related news around the IPO period, as company-related news can have a significant effect on the performance after the IPO. The general market conditions also have significant effects on IPO underpricing, as now in recent times when the IPO markets have been quiet,

the investors have demanded higher discounts to IPOs (PwC, 2023). Thus, the limitations of this study offer potential future research direction.

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