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ESG Ratings and IPO Underpricing: Analyzing the Impact of ESG Metrics on IPO Performance Across Hot and Cold Markets

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ABSTRACT:
In recent years, environmental, social, and governance (ESG) factors have gained increasing attention in both corporate strategy and investment decision-making. While the long-term impact of ESG on firm performance has been widely studied, its short-term effects remain less explored. In particular, limited research has focused on the role of ESG in one of the most critical stages of a company's lifecycle: the initial public offering (IPO). This thesis examines how ESG ratings influence IPO underpricing and whether this relationship is affected by prevailing market conditions.

The theoretical part of the thesis is based on the idea that investors often lack complete information about a company at the time of its IPO. This is called asymmetric information between issuing parties. Because of this, IPO pricing can be uncertain and thus prone to mispricing. To reduce this uncertainty, companies may try to send signals to the market by sharing visible indicators such as ESG scores. This study explores whether ESG information influences how investors price IPOs.

The empirical analysis is based on a dataset of U.S. IPOs issued between 2010 and 2023. The data sample consists of 711 companies, of which 301 have an ESG rating from the year of issuing. The data are sourced from the London Stock Exchange Group (LSEG), with IPO information collected from the SDC Platinum database and ESG ratings obtained from Datastream. This thesis employs Ordinary Least Squares (OLS) regression model to investigate the relationship between ESG ratings and IPO underpricing, and to assess whether this relationship is influenced by market conditions. IPO underpricing is measured by comparing the offer price to the closing stock price across several time periods, including the first day, one week, one month, three months, six months, and one year after the IPO. Three regression models are applied: the first examines whether the presence of an ESG rating affects underpricing, the second analyzes the impact of ESG score magnitude and its individual components, and the third includes interaction terms to test whether the effect of ESG varies across hot and cold IPO market periods.

The results show that ESG scores are associated with higher underpricing in the short-term, suggesting that investors may react positively to companies that disclose ESG information. However, the actual level of ESG performance does not appear to reduce underpricing in a consistent or meaningful way. Furthermore, there is no evidence that the market environment significantly moderates the impact of ESG on underpricing. These results suggest that ESG acts as a broad signal of firm quality, rather than just impact changes based on market conditions. Thus, while ESG may attract investor interest, its role in IPO pricing is limited and largely depends on presence rather than performance.

KEYWORDS: initial public offering, IPO, underpricing, ESG, environmental, social, governance, investing, hot market, cold market

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TIIVISTELMÄ:
Ympäristöön, yhteiskuntaan ja hallintotapaan liittyvät ESG-tekijät ovat saaneet viime aikoina yhä enemmän huomiota yritysten strategisessa päätöksenteossa. ESG:n pitkän aikavälin vaikutuksia yrityksen suorituskykyyn on tutkittu laajasti, kun sen vaikutukset lyhyen aikavälin suorituskykyyn tunnetaan heikommin. Erityisesto ESG:n rooli yrityksen elinkaaren yhdessä kriittisimmässä vaiheessa, listautumisannissa, on tutkittu rajallisesti. Tässä tutkielmassa tarkastellaan, miten ESG-luokitukset vaikuttavat listautumisantien alihinnoitteluun sekä vaikuttavatko vallitsevat markkinaolosuhteet tähän yhteyteen.

Tutkielman teoreettinen osa pohjautuu ajatukseen, jonka mukaan sijoittajilla ei ole täydellistä tietoa yrityksestä sen listautuessa. Tätä kutsutaan informaation epäsymmetriaksi sidosryhmien välillä. Tästä syystä listautumisten hinnoittelu voi olla epävarmaa, mikä altistaa hinnoitteluvirheille. Vähentääkseen tätä epävarmuutta yritykset voivat pyrkiä signaloimaan omaa laatuaan käyttämällä ESG-luokittelua. Tässä tutkimuksessa selvitetään, vaikuttaako ESG-tieto siihen, miten sijoittajat hinnoittelevat listautumisanteja. Empiirinen analyysi perustuu aineistoon Yhdysvaltojen markkinoilta vuosina 2010–2023 toteutetuista listautumisista. Aineisto sisältää 711 yritystä, joista 301:llä on ESG-luokitus listautumisvuodelta. Aineisto on peräisin London Stock Exchange Groupilta (LSEG), ja tiedot listautumisista on kerätty SDC Platinum -tietokannasta sekä ESG-luokitukset Datastream-palvelusta. Tutkielmassa hyödynnetään OLS-regressiomallia, jolla tutkitaan ESG-luokitusten ja alihinnoittelun välistä yhteyttä sekä arvioidaan, vaikuttavatko markkinaolosuhteet tähän yhteyteen. Alihinnoittelu lasketaan vertaamalla osakkeen listautumishintaa useisiin eri ajanjaksoihin: ensimmäiseen päivään, viikkoon, kuukauteen, kolmeen kuukauteen, kuuteen kuukauteen sekä vuoteen. Käytössä on kolme regressiomallia, joista ensimmäinen tutkii, vaikuttaako ESG-luokituksen olemassaolo alihinnoitteluun. Toinen analysoi ESG-pistemäärän ja sen yksittäisten komponenttien vaikutusta, ja kolmas tuo mukaan interaktiotermit, joilla testataan, vaihteleeko ESG:n vaikutus kuumien ja kylmien IPO-markkinajaksojen välillä.

Tulokset mukaan ESG-luokitukset ovat yhteydessä korkeampaan alihinnoitteluun lyhyellä aikavälillä, mikä viittaa siihen, että sijoittajat reagoivat positiivisesti yrityksiin, jotka raportoivat ESG-tietoja. Kuitenkaan varsinaisella ESG-suorituskyvyn tasolla ei näytä olevan johdonmukaista tai merkittävää vaikutusta alihinnoittelun vähentämiseen. Lisäksi tulokset eivät anna näyttöä siitä, että markkinaympäristö merkittävästi muuttaisi ESG:n vaikutusta alihinnoitteluun. Tulokset viittaavat siihen, että ESG toimii laajana signaalina yrityksen laadusta eikä pelkästään markkinaolosuhteiden mukaan muuttuvana tekijänä. Näin ollen, vaikka ESG saattaa herättää sijoittajien kiinnostusta, sen rooli IPO-hinnoittelussa on rajallinen ja riippuu pitkälti ESG:n olemassaolosta ennemmin kuin sen suorituskyvystä.

AVAINSANAT: listautumisanti, alihinnoittelu, ympäristövastuu, yhteiskuntavastuu, hyvä hallintotapa, sijoittaminen, kuuma markkina, kylmä markkina

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1 Introduction

Recently, more investors, regulators and other stakeholders have started to pay attention to how companies manage environmental, social and governance (ESG) risks. Increasingly, how a company manages these issues is seen as part of good business practice. Consequently, 80% of large and mid-sized companies around the world published a CSR report in 2020—compared to just 12% back in 1993 (KPMG, 2020). The integration of ESG into a company's overall strategy is linked to the broader idea of risk management, which looks at both responsibilities such as corporate social responsibility and more practical, day-to-day risks such as operations and finances. There is also growing evidence and consensus in the academic literature that companies with a strong ESG profile tend to perform better financially (Cheng et al., 2014; Friede et al., 2015). Giese et al. (2019) provide further support by finding a clear link between higher ESG ratings and financial performance. As a result, in 2020, about 25% of all U.S. investments which is around $12 trillion, were in ESG-rated assets (Go, 2022).

As ESG has become a key focus of corporate reporting and investor decision-making, it raises questions about its role during one of the most sensitive events in a company's lifetime: the IPO. When a company goes public, the information asymmetry between it and the market increases (Rock, 1986). Before issuing, disclosing ESG can act as a signal for investors to assess a company's risks and thus reduce asymmetric information. This can influence how an IPO is priced post-IPO, in other words, underpriced. An IPO that is underpriced will increase in value more comparably to its original offering price. This can be seen as unfavorable to the issued company. In the U.S., IPOs were on average underpriced more than 20% during the 1990s (Ljungqvist, 2007). Therefore, a company that reports its ESG before going public, could reduce its underpricing and thus leave less money on the table (Ferri et al., 2023).

The IPO market is cyclical, meaning that both the proceeds raised and the number of IPOs change over time (Boeh & Dunbar, 2014). A high volume of newly public companies indicates a hot market, whereas a low volume indicates a cold market (Ibbotson & Jaffe,

1975; Ritter, 1984). According to Helwege and Liang (2004), the adverse effects of asymmetric information are reduced during hot market. Firms can take advantage of this phenomenon by listing during a hot market, thereby reducing the burden of asymmetric information. This raises questions about what information investors value most and what they are willing to give up for higher returns that have been shown to be available in hot markets (Ljungqvist, 2007).

1.1 Purpose of the Study

The purpose of this study is to investigate the impact of ESG factors on the underpricing of IPOs and whether this relationship changes depending on IPO cycles. In recent years, ESG has become one of the most discussed topics in the financial world. Companies are increasingly expected to report on their ESG practices, and investors are paying more attention to these difficult-to-interpret non-financial factors when making decisions. Moreover, there is evidence that ESG has an impact on financial performance (Friede et al., 2015; Yu, 2024), and thus the relationship between these factors needs to be further researched.

The motivation towards this topic arises from previous literature according to which there is no single clear explanatory factor justifying the underpricing of IPOs. Rock (1986) suggests the main reason for underpricing is asymmetric information between the issuing parties, which is perhaps the most common theory explaining underpricing among researchers. As ESG disclosure provides additional information about issuing companies, it is expected to reduce the amount of asymmetric information and thus be reflected in reduced underpricing (Ferri et al., 2023).

However, there is evidence opposing this view. According to Friede et al. (2015), good ESG performance is positively correlated with good financial performance. Thus, the good financial performance seen after the IPO would be reflected in strong underpricing. This puts pressure on the company to raise the initial offering price in the IPO, which may increase the risk of IPO failure (Welch, 1992). Furthermore, Economidou et al. (2022)

and Schmunkamp (2025) find in their studies that companies which disclose ESG before going public experience more underpricing. These findings are aligned with signaling theory, according to which ESG ratings can be interpreted as indicators of firm quality (Huang, 2021). Therefore, it is not clear how ESG affects IPO underpricing.

1.2 Hypotheses Development

This thesis has developed three hypotheses and a research question based on theoretical framework and existing literature. Each hypothesis consists of a null hypothesis and an alternative hypothesis, resulting in a total of six statistical statements. Although the main reason for IPO underpricing has not been determined, the asymmetric information-based theories offer the prevailing consensus at this time. Moreover, given the uncertainty and limited information associated with IPOs, ESG ratings can help investors by providing an indication of the quality of the company. Furthermore, the common academic consensus is that ESG factors affect underpricing. However, it is unclear whether ESG increases or decreases underpricing. Therefore, this thesis studies what is the impact of ESG disclosure on underpricing and how the impact of ESG factors changes depending on whether the market is hot or cold. This leads to the research question:

“How do ESG ratings affect the underpricing of IPOs and does this effect vary under different market conditions?”

The hypotheses of this thesis have been generated based on the limited previous literature found related to the subject. (Duong et al., 2024; Economidou et al., 2022; Ferri et al., 2023; Fu et al., 2023; Schmunkamp, 2025). Overall, findings on the impact of ESG on the underpricing of IPOs are mixed. Duong et al. (2024) provide evidence that companies which go public in countries that have introduced mandatory ESG disclosure tend to experience significantly lower underpricing. They find that the first-day IPO returns are on average around 23% lower compared to companies in countries without such requirements. This suggests that ESG reporting can help reduce information asymmetries between issuing parties. Fu et al. (2023) add that early ESG disclosure is associated with

better IPO survival rates and long-term performance, highlighting the importance of ESG in IPOs.

Schmunkamp (2025), on the other hand, provides opposing results. His research on the U.S. IPO market between 2007 and 2022 finds that disclosing ESG prior to issuance increases underpricing. He suggests that disclosing ESG before going public sends a signal to investors about the quality of the company. Because of this signal, the stock experiences amplified demand, which in turn is reflected in increased underpricing. Similarly, Economidou et al. (2022) provide evidence that ESG disclosure is associated with higher underpricing. Like Schmunkamp (2025), they argue that a positive market reaction to ESG disclosure increases investor enthusiasm, leading to stronger initial performance after the IPO.

Furthermore, this thesis focuses on the U.S. IPO market aiming to provide a comprehensive picture of the link between ESG and underpricing in North America. The focus is on the U.S mainly because the U.S does not have a coherent legal framework for ESG reporting (Cicchiello et al., 2022). As a result, ESG reporting in the U.S. is often based on voluntary and private standards, which can lead to inconsistencies in how companies report and how investors interpret ESG data. For comparison, Ferri et al. (2023) study the European market and find that ESG has a meaningful impact on the underpricing of IPOs. They argue that disclosing ESG before going public fills a void created by asymmetric information leading to reduced underpricing as investors gain more knowledge which to derive their decisions from. Overall, given the conflicting evidence and the lack of consensus in previous studies, it remains an open question whether ESG disclosure mitigates or strengthens underpricing. Thus, based on the theoretical background and previous literature, the first hypothesis of the thesis is:

$H_{0,1}$: Companies with an ESG rating prior to IPO are not underpriced less than companies without an ESG rating.

$H_{1,1}$: Companies with an ESG rating prior to IPO are underpriced less than companies without an ESG rating.

The second hypothesis changes perspective. The first hypothesis takes into consideration whether a company has an ESG rating at all. To further clarify the impact of ESG on the underpricing of IPOs, the second hypothesis examines how the actual value of the ESG rating affects underpricing. Studies from Aydoğmuş et al. (2022) as well as Amel-Zadeh and Serafeim (2018) find that ESG rating is positively and significantly correlated with firm value. Furthermore, Naeem et al. (2022) find that both the total ESG score and the individual E, S and G components are positively and significantly related to firm value. This suggests that firms with strong ESG scores benefit from lower discount rates, which in turn supports higher firm valuations. When ESG efforts are perceived as credible, companies are often rewarded with higher market valuations. Thus, ESG rating is considered to be an influential factor that is reflected in financial performance.

However, the findings on the relationship between ESG rating and financial performance are mixed. Halbritter and Dorfleitner (2015) find that companies with high ESG ratings do not seem to generate significantly different returns than companies with low ratings. This is true not only for the overall ESG score, but also when looking separately at the E, S and G pillars. Additionally, Aupperle et al. (1985) argue that the most sound studies find an insignificant relationship between sustainability and financial performance.

Based on the literature and the theoretical perspectives presented earlier, the theory of asymmetric information would suggest that higher ESG scores reduce uncertainty and thus reduce underpricing (Ferri et al., 2023). The findings of Fu et al. (2023) suggest that underpricing can be expected to increase as ESG performance improves. Conversely, according to the signaling theory, strong ESG rating can act as a positive signal of firm quality, resulting in an increase of investor demand and thus strengthening underpricing (Economidou et al., 2022; Schmunkamp, 2025). To conclude, it is unclear if stronger ESG

performance amplifies or reduces IPO underpricing, which underlines the importance of examining this topic. Therefore, the second hypothesis is:

$H_{0,2}$: Companies with higher ESG scores are not underpriced less than companies with lower ESG scores.
$H_{1,2}$: Companies with higher ESG scores are underpriced less than companies with lower ESG scores.

As stated, IPO markets come in waves (Boeh & Dunbar, 2014). On top of that, market conditions affect the underpricing of IPOs (Ibbotson & Jaffe, 1975). As the number of IPOs increase in hot IPO periods, underpricing increases, and as the number of IPOs decrease in cold IPO periods, underpricing decreases. A study done by Ritter (1984) of 1028 IPOs between 1977 and 1982 finds an average underpricing of 16,3% when during hot issue period in January 1981 the average underpricing rose up to 48,4%. Furthermore, Ljungqvist (2007) states that the mean underpricing in the 1990s in U.S. was 20%, while during the hot market in 1999 and 2000 the average underpricing rose to over 50%. Therefore, it can be stated that the market timing has a large impact on underpricing. This leads us to the question: Could the results of the second hypothesis change depending on the market period? In more detail, could the effect of ESG on underpricing change with hot and cold markets or does it remain neutral throughout. These considerations bring us to the third hypothesis:

$H_{0,3}$: Market conditions (hot vs. cold issue markets) do not significantly moderate the relationship between ESG scores and IPO underpricing.
$H_{1,3}$: Market conditions (hot vs. cold issue markets) significantly moderate the relationship between ESG scores and IPO underpricing.

1.3 Intended Contribution

Although ESG has received much attention in recent years, there is still surprisingly limited amount of research on how ESG factors affect the underpricing of IPOs. This study

aims to help fill this research gap. The first objective of this study is to investigate whether ESG rating alone can help reduce information asymmetries between companies and investors in IPOs. In other words, does the rating send a credible signal that reduces the perceived risk of an IPO and hence underpricing? Ferri et al. (2023) find that companies which possess an ESG rating at the time of issuance experience less underpricing than companies which issue without disclosing ESG. Furthermore, this thesis looks at whether the actual level of ESG score makes a difference. According to Fu et al. (2023) companies with higher ESG scores are more likely to survive after going public. This is mostly due to the social and governance factors, not the environmental ones. If higher ESG scores lead to lower underpricing, this could suggest that investors reward companies with strong ESG performance during IPOs. These questions are important for companies considering how much effort to put into ESG disclosure before going public.

Moreover, the main contribution of this thesis is to explore how the impact of ESG on underpricing varies according to market conditions. More specifically, the aim of this study is to examine whether the benefits of ESG are consistent in both hot and cold IPO markets. This aspect is particularly significant because, to the best of our knowledge, it has not been directly addressed in previous literature. Moreover, it is directly related to the real world: should companies prioritize achieving ESG ratings before going public, or are other IPO-related tasks, such as timing or investor targeting more important? As a result, this thesis provides a new lens through which companies can assess the strategic importance of ESG when preparing for an IPO.

1.4 Structure of the Study

This thesis is divided into nine chapters, consisting of theoretical, literature and empirical sections. The first chapter presents the purpose and intended contribution of the study, the hypotheses to be tested and the structure of the thesis. The second chapter focuses on IPOs and examines the motivations for IPOs, the theories explaining underpricing and the concept of IPO market timing, including an overview on hot and cold issue markets. The third chapter provides a theoretical background to the study about ESG and further

discusses shareholder and stakeholder theories. The review of previous literature starts from chapter four. In this chapter, we dive into the literature about underpricing of IPOs and the reasons why IPOs are underpriced. Furthermore, the fifth chapter discusses the relationship of SRI and ESG on financial performance. Chapter six connects ESG concepts to the context of IPOs and builds a foundation for understanding how ESG factors influence IPO performance. Chapter seven presents the data and methodology used to test the hypotheses, including data and variable descriptions, data sources and regression models. Chapter eight presents the results of the analysis and discusses the results in relation to hypotheses and existing literature. Finally, the thesis concludes by summarizing the main findings, discussing practical implications and limitations of the study as well as suggesting recommendations for further research.

2 Initial Public Offering

Initial Public Offering (IPO) is the process by which a private company offers its shares to the public for the first time and becomes a publicly traded company on the stock exchange. This process allows a company to raise capital by selling shares to institutional and private investors. IPOs are crucial for companies because they raise funds that can be used to promote growth, pay down debt or invest in new projects. Furthermore, IPOs are important for the wider financial markets as they offer investors the opportunity to participate in the early stages of a company's public growth.

2.1 Motivation to Go Public

There are many reasons for companies to go public. When a company has an opportunity or a situation that requires financing, it has a few options. The firm can take a loan, or it can acquire money from investors for own equity. IPO is one of the ways for private companies to gather equity. Companies have their own reasons for issuing, but the primary reason observed is to acquire capital for growth (Ritter & Welch, 2002). Rydqvist and Högholm (1995) perform a survey of incentives on why firms want to go public and find that 97% of the respondents list financial reasons as important factors. The financial reasons offered in the survey are growth financing, facilitating future reissuance, reducing the debt/equity ratio, improving credit rating, providing liquidity for current owners and facilitating the succession of control. The survey shows that financial reasons are dominant when going public. For comparison, productivity reasons were only cited by 73% of respondents, and include employee stock ownership, publicity and performance evaluation.

Pagano et al. (1998) find in their research concerning Italian IPOs that gained capital from IPOs is usually used for acquisitions, financing large investments or for strengthening the capital structure of the company’s balance sheet. Kim and Weisbach (2008) continue by reexamining the conclusion and find that debt reductions are more often paid by internally gained capital than new capital. They think that new equity is most often used to

finance new investments. In addition, Pagano et al. (1996) notes that listing companies can borrow money on better terms. This is because near the IPO date short-term interest rates fall and the number of banks eager to lend increases.

Furthermore, firms go public due to the desire of initial owners to sell their ownership of the company in whole or in part. Before a company is public, its shares aren't for sale to investors in the stock exchange market. Therefore, the owners of private companies have a more challenging time getting rid of their ownership than the owners of public companies. This is because alongside listing, the liquidity of the firm's shares increases during entry to the stock market, making it easier for the owners to find suitable buyers. Going public also improves the shares' valuation certainty, which allows the markets to set the price for the transaction (Chod & Lyandres, 2011). Also, when ownership is divided among a larger number of investors, the company's risk becomes more decentralized. Zingales (1995) states in his study that one reason for going public is the owner's desire for change in the firm's ownership while at the same time maximizing the income of the current owners. Going public and selling shares can be a clean way to change the ownership of a company. In an IPO, initial owners can get rid of all their ownership or reduce it. Pagano et al. (1996) discover that after IPOs, initial owners tend to keep an ownership of 60% in Italian companies. In these cases, initial owners want to hold on to a large number of shares to ensure absolute control over the firm. They conclude that in general initial shareholders' disinvestment appears in the IPO itself, and not after the company is public and available for all investors in the stock exchange market. Because of this, the authors believe that ownership and control aren't the primary reasons for listing.

Issuing gathers a lot of attention from potential individual and institutional investors as well as from the company's peers (Aghamolla & Thakor, 2021). Public image is seen as one of the benefits of listing. Röell (1996) refers in her overview of the decision to go public to Ransley's (1984) unpublished survey that ranks enhanced company image and publicity as second most important factor to go public. In addition, Rydqvist and

Högholm (1995) find that 67% of the respondents in their study thinks that enhanced publicity is an important reason to go public. However, there are researchers who do not see public image weighing as much as other factors in the decision to go public. Ritter and Welch (2002) belong in this category and claim that public image doesn't rank as high as other reasons, such as securing new financing.

Going public isn't free. IPOs do not just cost money but have effects on listing firms in other ways. Costs of listing can be categorized into direct costs and indirect costs. Direct costs are formed from many different fees, for instance: stock exchange fees, underwriting fees, auditing fees and registration fees (Pagano et al., 1998). Direct costs tend to stay the same regardless of the size of the IPO, which is why the price tag of the IPOs of smaller companies are relatively bigger. Ritter (1987) examines direct and indirect costs of IPOs in the U.S. and estimates that direct costs of listing are proximately 250 000 dollars and the variable costs 7% of the firm's gross income. For comparison, in Italy the fixed costs are approximately the same as in the U.S., while the variable costs are just 3,5% of the gross income (Pagano et al., 1998). From this, it can be concluded that the total costs of IPOs are higher in the U.S. than in Italy. This information can be summed up to suggest that IPOs cost a different amount in different markets and marketplaces.

Moreover, stock exchanges obligate listing companies to disclose information that private firms do not have to (Pagano et al., 1998). Unveiling information about future research and development programs or other important strategies can hinder firms' abilities to compete with their rivals. For example, high-tech firms are known to suffer from increased reporting obligations. Also, the reporting obligation affects the taxation of firms. Pagano et al. (1996) argue that the amount of taxes a company pays rises noticeably around the IPO date probably due to the increased visibility of a company.

2.2 Underpricing

Reasons for underpricing have been studied broadly in financial literature over time. Previous research presents several theories explaining underpricing. This section discusses

these theories in three categories: (i) Asymmetric information-based theories, (ii) Behavioral theories, and (iii) Institutional theories.

2.2.1 Asymmetric Information-based Theories

Theories related to information asymmetry are based on the assumption that all parties related to a new issue do not have the same type and amount of information. These parties consist of the issuing company, the underwriter, which is commonly an investment bank, and investors in the stock market purchasing newly listed securities. Asymmetric information-based models assume that there are some parties with more complete information regarding the issuing company. Therefore, offering prices reflect these asymmetries and are priced in favor of the most informed parties.

One of the most supported theories based on asymmetric information is Rock's (1986) winner's curse theory. According to the winner's curse theory, underpricing occurs because of information asymmetry between issuing parties. Rock (1986) categorizes investors into two different groups depending on what information they possess. These groups are called informed and uninformed investors. The informed investors are generally seen as institutional investors and uninformed as private investors. The informed investors have more information than any other issuing party, including the issuing company, the underwriter, and uninformed investors. The extra information they possess allows them to only participate in IPOs that are underpriced. In contrast, uninformed investors take part in every IPO because they do not know whether the IPO is underpriced or not.

After this breakdown, there are two possible scenarios. First, when an IPO is underpriced, it is ordinarily oversubscribed. Because of the oversubscription, usually, no investor receives the number of shares subscribed initially but only a portion. This means that both informed and uninformed investors do not get the number of securities initially planned. The other scenario occurs when an IPO is not underpriced. In this situation, the informed investors do not participate in the IPO at all, but the uninformed investors do because of

their lack of information. This leads to a situation where uninformed investors experience the winner's curse. Uninformed investors receive every share initially subscribed in IPOs that are not underpriced, and on the contrary, receive only a portion of initially subscribed shares in underpriced IPOs. Due to the winner's curse, investors' returns can turn negative, resulting in uninformed investors withdrawing from the market.

Rock (1986) claims that IPOs rely on uninformed investors because without their investments, even tempting IPOs would witness a decline in demand. This would lead to a situation where issuing companies are no longer able to gather the requisite amount of capital through IPOs. Therefore, he sees that the path to a successful IPO is by underpricing so that the uninformed investors keep their faith in IPOs. Ljungqvist (2007) adds that issuing firms have an individual incentive not to underprice as much as others because of the free-ride problem. Issuing firms can rely on the underpricing of other issuers and thus price themselves higher and still enjoy the contribution of uninformed investors. Also, underwriters have pressure to underprice IPOs so that they keep the issuing parties optimistic, and thus do not lose underwriting provisions in later future (Beatty & Ritter, 1986).

Allen and Faulhaber (1989) as well as Welch (1989) see that winner's curse could be easily avoided by withdrawing an issue when informed investors are not investing in it. Another possible way to avoid winner's curse is by using institutional investors proficiency to price the IPO more correctly. They believe that instead of informed investors possessing the most complete information regarding an IPO, the issuing company itself is the most informed party and has the best view about its future cash flows. Signaling theory is based on the assumption that issuing companies want to leave a good taste in the mouths of investors. According to signaling theory listing companies are willing to "signal" their true value for investors by decreasing their offering price (Akerlof, 1970). However, it can be argued that signaling by reducing initial offering price is not a cost-effective way for firms to communicate with their potential investors because it leaves

money on the table. Therefore, firms can signal their quality by other means, for instance, by disclosing ESG.

Furthermore, signaling theory suggests that money lost in IPOs due to underpricing should be gathered in later seasoned equity offerings (SEOs) (Welch, 1989). Welch's (1989) paper shows that one-third of firms listed between 1977 and 1982 reissued a new equity offering before the year 1987. These offerings were generally three times larger compared to the IPO. In addition, Álvares and Gonzáles (2005) finds support from Spanish capital markets that companies underprice their IPOs in order to sell more shares with higher price in future SEOs.

According to signaling theory firms can be divided into high-quality firms that have good investment prospects and work in a profitable industry, and low-quality firms that are the opposite (Allen & Faulhaber, 1989). The theory assumes that only high-quality firms can regain the amount lost due to underpricing while low-quality firms know they do not have the capability to regain losses caused by underpricing. This is because firms possess superior information compared to other issuing parties, and thus can evaluate their expected performance and future market valuation. Therefore, low-quality firms do not want to underprice deliberately because they know it would be unprofitable. Only firms that can deal with the money left on the table can give a signal. Ghosh et al. (2000) suggest that high-quality companies underprice their IPOs purposely in order to redeem more equity later in higher-priced SEOs. They find a strong positive relation between SEO underpricing and IPO underpricing. Their results show that companies that benefit from signaling in IPOs tend to price their SEOs appealingly to attract same investors back in the market.

Ljungqvist and Wilhelm (2003) argue that the principal agent problem is the real cause of underpricing. Principal agent problem anticipates conflicts of interest between issuing firms and investment banks that handle the underwriting, counseling, and distribution of the IPO. This is because investment banks are tempted to act in a way that benefits

their own interest more than their customer's interest. Issuing firms are eager to profit from IPOs as much as possible while banks wish to minimize their time costs and capital used in issuing processes. According to the problem, investment banks have an incentive to take side payments from investors that are contending for allocations of underpriced IPOs. (Ljungqvist, 2007). This behavior of investors is called rent-seeking behavior. Also, investment banks tend to underprice purposely because if not all shares are subscribed in the IPO, the reputation of the investment bank can decline. Ritter (1998) states that investment bank's need to market an IPO reduces the more the IPO is predicted to be underpriced. Thus, underwriters can use underpricing to decrease their marketing expenses.

Baron (1982) believes that issuing companies need assistance from investment banks to go public efficiently. He created a model that concentrates on the advantages investment banks provide issuers in exchange for underpricing. The model assumes that underwriters have superior information compared to issuing companies which allows them to underprice. Baron (1982) offers an example where issuers and banks are identically informed. In this situation, the contract between the issuing parties includes only distribution services. Therefore, the company itself could price the IPO at an optimal price level without the help of an investment bank. However, when banks have more information, like Baron (1982) presumes, issuing firms must trust banks to settle the price. Ljungqvist (2007) states that the more there is uncertainty concerning the correct valuation of listing firms, the stronger information asymmetry rises. The more information asymmetry grows, the more issuing companies must rely on the services of investment banks which leads to stronger underpricing.

2.2.2 Behavioral Theories

Prospect theory provides an explanation for the question, why firms are leaving money on the table. This theory is developed by Kahneman and Tversky (1979) who suggest that investors base their decision-making on the likelihood of possible gains and losses. Furthermore, prospect theory argues that investors make their choices based on the utility

relative to a benchmark rather than the absolute income, and that investors dislike losing their investments more than making equivalent gains.

Prospect theory supports underpricing because of the utility gained with it. Loughran and Ritter (2002) argue that issuers cover the lost amount of money due to underpricing in the first few trading days because of a price jump. This price jump benefits specifically all pre-issue shareholders. Prospect theory proposes that issuing companies achieve net gain with underpricing and that the costs of underpricing are paid back to the initial owners. However, this model only works when initial owners sell a small number or no shares in the IPO.

Welch (1992) proves that informational cascades can occur in IPOs where investors do not trust their private information, but act based on the decisions of early investors. This behavior is called herding and means that investors copy the decisions of crowds instead of using their own knowledge (Bikhchandani & Sharma, 2000). Cascades theory suggests early investors have a greater influence in IPOs compared to later investors (Welch, 1992). Cascades can begin with a small set of information. If the initial demand of an IPO is strong it can be expected that early investors have significant information. As a result, later investors are also attracted to invest in the IPO. In these situations, the IPO is probably oversubscribed leading to an allocation in which investors only get a fraction of shares they wanted in the first place. However, if the initial demand of an IPO is weak it is likely that early investors have knowledge about the IPO being overpriced. Because of the weak initial demand later investors do not invest either. Thus, weak initial demand can lead to IPO failures in which the issuing firms are not able to gather the requisite amount of capital through IPOs. Hence, cascades theory claims that the success of an IPO depends on the decisions of early investors.

2.2.3 Institutional Theories

According to price stabilization theory IPOs are not intentionally underpriced, however, they are priced by their expected market value (Ruud, 1993). Hence, issuing parties allow

stock prices to rise after IPO executions and subsequent price corrections are prevented by underwriters. This leads to situations where IPOs are usually underpriced because all overpriced IPOs experience actions to build their price in the post-IPO market. Price stabilization theory suggests this is the reason for abnormal first-day returns. Ruud (1993) also finds that without price stabilization actions first trading day returns are near zero meaning that price stabilization is the primary reason for underpricing. Utamaningsih et al. (2013) reminds that price stabilization is expensive for underwriters and suggests that by underpricing in advance, the need for price stabilization can be avoided.

Hanley et al. (1993) find evidence that supports Ruud's (1993) research. The authors state that price stabilization has a strong impact in the post IPO markets and is often ignored in previous studies concerning underpricing. They argue that price stabilization modifies IPOs demand as well as supply and may lead to subsequent losses for investors due to the artificial prices born on the behalf of price stabilization. Price stabilization has received criticism because of the difficulty of detecting it. Researchers have had trouble identifying the real reason for the decline in stock valuations. It is hard to say if the decline in stock valuation is happening because of normal supply and demand or because of price stabilization. However, Benveniste et al. (1996) see that price stabilization is a justified action for underwriters because they have a natural incentive for it. Underwriters' fees rise in gross proceeds which leads them wanting to increase the price of the offer. Price stabilization is also a way to "bond" investors and underwriters.

The Securities Act of 1933 in the U.S gives investors heavy protection regarding securities that can be purchased from public markets, meaning that listed firms have a risk of facing legal liabilities in post-IPO markets if they are accused of violating the act (Tinic, 1988). Thus, intentional underpricing serves as a type of insurance against these possible litigations that consider the issuing company or the investment bank. Tinic (1988) believes that underpricing IPOs intentionally can save issuing parties from possible legal consequences. His model predicts that when the probability of facing legal actions following an IPO is low, the IPO does not have to be as underpriced as if legal actions would be a

threat. The data sample in his research shows that underpricing has changed from post-SEC time compared to the time after the act. Even though there was underpricing before the act, underpricing has grown significantly which supports his hypothesis of using underpricing as an insurance.

Lowry and Shu (2002) examine the connection between litigation risk and underpricing. Their research shows that between the years 1988 and 1995 4,6% of IPOs faced legal consequences. The costs that incurred from these events were approximately 13,3% of the assets gained in the IPOs themselves. Based on the numbers shown in this study, it is clear that issuing companies and investment banks want to avoid possible legal consequences related to IPOs. Ljungqvist (2007) reminds that money is not the only possible cost concerning legal issues. Unnecessary legal activities waste time and affect the reputation of firms and investment banks. Investment banks that are often involved in IPOs that face legal consequences have a risk of losing trust of their clients, while listing companies might encounter greater costs of capital in future offerings.

2.3 Hot and Cold Issue Markets

As discussed earlier, the incentives of firms to issue varies from one to another. Many researchers have focused on firm-specific reasons to explain the reasons firms go public. However, there are also problematic aspects to listing. For example, underpricing, long-term underperformance and IPO failure are typical concepts for companies to think about before listing (Helwege & Liang, 2004; Ritter, 1984). The going public decision also depends on the country's economic situation which can vary significantly between countries (Dittmar & Dittmar, 2008). During periods, when several private firms feel that the moment to issue is optimal and decide to execute their IPOs, the IPO market gets heated. These heated periods are called hot issue markets. On the contrary, cold issue markets are periods when listing activity is lower than usual.

Ibbotson and Jaffe (1975) were the first ones in academic literature to examine hot and cold issue markets. They identify hot and cold issue markets by looking at the

performances of firms that have executed their IPOs in the last month. During hot issue markets the mean returns of IPOs after the first few trading months are abnormally high, while in cold issue markets initial returns are lower than usual or at some points even negative. They discovered evidence that IPO markets are cycled meaning that IPO markets fluctuate from hot markets to cold markets in different times. Ritter (1984) also finds evidence that backs up the IPO market cyclicality theory and discovered existence of 3-4 hot issue periods between the years 1960-1982 in which IPO volumes had been significantly higher compared to other periods. Ibbotson and Jaffe (1975) argue that recognizing hot issue markets is possible due to cyclicality and it is possible for investors to take advantage of heated markets and gain abnormally high returns. This creates market inefficiency that is against Fama's (1970) efficient market theory which presumes that markets are efficient and abnormally high returns are impossible to achieve.

Figures 1 and 2 below prove that the IPO market is indeed cyclical, as they show clear patterns of IPO activity and initial returns over time (Ibbotson et al., 1994). Figure 1 illustrates the number of IPOs issued each month in the U.S. between 1960 and 1992, with clear peaks during busy periods in the market, hot markets. These periods are characterized by a sharp increase in the number of IPOs as companies take advantage of favorable investor sentiment and higher valuations. In contrast, cold markets are characterized by a significant decline in the number of IPOs, reflecting a decrease in investor demand. Figure 2 complements this by showing the average initial returns on IPOs over the same period, which tend to rise high in hot markets and fall in cold markets. Together, these figures suggest that higher initial returns encourage more firms to issue shares, thus creating hot market cycles, while lower returns in cold markets discourage IPOs. Furthermore, Ritter's (1984) research of 1 028 IPOs from the years 1977-1982 finds that average underpricing was 16,3% when during hot issue period in January 1981 the average underpricing rose to 48,4%. Ljungqvist and Wilhelm (2003) find further evidence of hot issue markets in their study about the dot-com bubble. Their research provides evidence of a hot issue market in the years 1999-2000 when the returns from the first few

trading days were approximately 73% per IPO compared to the year 1996 when the returns of the first few trading days averaged 17%.

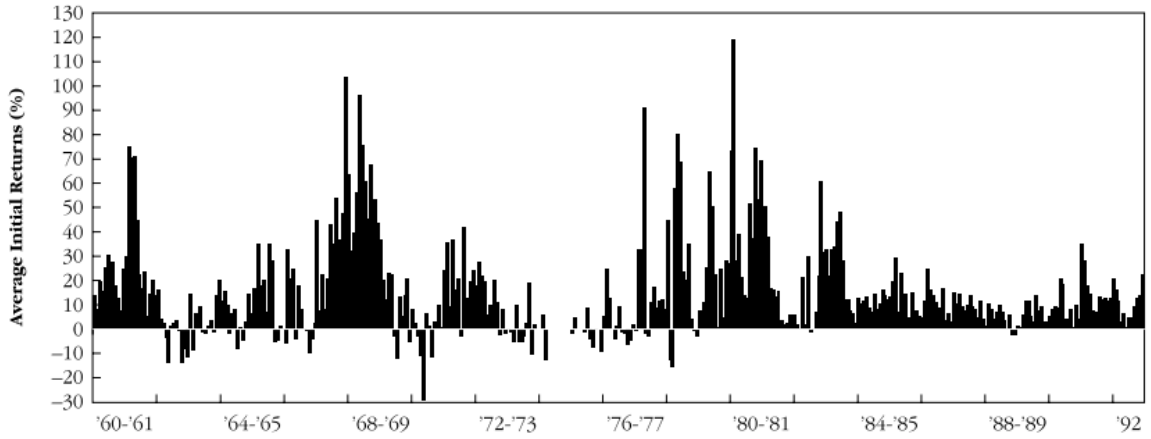

Figure 1. Number of IPOs by month in the U.S. in the years 1960-1992 (Ibbotson et al., 1994).

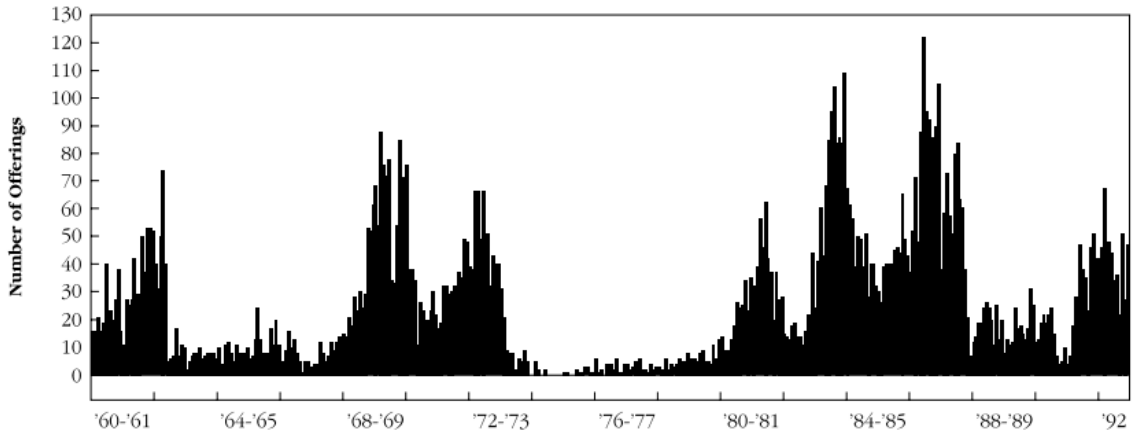

Figure 2. Mean initial returns by month in the U.S. in the years 1960-1992 (Ibbotson et al., 1994)

Researchers have struggled to find reasons why hot issue markets exist. Ritter (1984) suggests that a change in the risk factor of firms' affects the average amount of underpricing in IPOs. He argues that riskier companies tend to be more underpriced than companies that are less risky. According to his theory, there are periods when the risk levels of companies increase. This leads to generally higher mean initial returns for each issued company. Thus, even though there is evidence that companies that list during hot issue

markets are riskier, underpricing seen during hot markets is so high that it cannot be explained only by the change in the risk levels of firms.

The second explanation offered to explain hot issue markets argues that investors create hot issue markets (Rajan & Servaes, 2002). This explanation assumes that investors invest in issues in the post-IPO markets if they have positive experience of increased prices of earlier IPOs. This strategy is comparable to momentum strategy according to which investors invest in stocks that have been successful recently. When several investors use the same strategy, it is possible they increase stock prices leading to bigger initial returns for early investors.

The “windows of opportunity” theory explains hot issue market cycles by suggesting that there are certain periods when companies can go public under more favorable conditions by either achieving higher valuations or gaining other advantages that are not as easily available at other times (Ibbotson et al., 1994). These periods are created by investors because they have overoptimistic views on the growth potential of issuing firms. Issuing firms can detect these opportunities and try to time their IPOs in these windows. When several companies attempt to execute their IPOs in these periods, it is possible that they create hot issue markets. In addition, the authors discover that when firms decide to take advantage of miscalculations of investors, it causes poor performance in the post-IPO market after hot issue period ends. Even though there is no single model explaining how hot issue periods are formed, there is evidence that it is a global phenomenon (Derrien & Womack, 2003).

Cold markets, on the other hand, are often associated with significant underpricing dynamics and changes in investor behavior. Aggarwal (2000) notes that cold market issuance tends to be oversubscribed, suggesting an imbalance between the offer price and actual demand. Cornelli and Goldreich (2001) support this by pointing out that in such periods, offer prices react more to the price offered than to the quantity demanded, which may reflect cautious investor bias and underwriting conservatism. Zhang (2004)

further adds that overallocation in cold markets can increase secondary market demand, which may be due to supply constraints or increased investor interest. Together, these studies suggest that cold markets shape different allocation and pricing strategies and thus, reinforce the unique role of market conditions in IPO outcomes.

2.4 Timing the IPO Markets

Market timing is an important part of the IPO process, as companies seek to maximize returns by taking advantage of favorable market conditions. According to Baker and Wurgler (2002), firms are likely to accelerate their IPO plans in hot markets, characterized by bullish investor sentiment and recent strong stock market returns. Such market conditions often lead to higher valuations and lower risk taking, encouraging firms to take advantage of optimistic pricing. In contrast, in cold markets, IPOs are usually postponed unless issuers face urgent financing needs (Lerner et al., 2003). As Pastor and Veronesi (2005) point out, managers often monitor long-term market trends, sometimes for up to two years, to anticipate reversal trends and identify the ideal timing of an issue. These dynamic highlights the interplay in decision making between market anticipation and financial need in the IPO timing process.

While going public in a hot market can be advantageous, the IPO process is neither quick nor simple, as it usually involves extensive preparation, regulatory oversight and marketing efforts. The duration of an IPO from registration to issuance varies depending on market conditions and regulatory requirements. During normal times, the average time to registration of a company is usually between 100 and 200 days (Boeh and Dunbar, 2014). However, in times of increased market uncertainty or economic difficulties, such as the dotcom crash or financial crisis, this time can increase significantly, in some cases, to more than 350 days. Delays are often caused by additional regulatory demands, changes to applications and firms waiting for more strategically favorable market conditions.

Plotnicki and Szyszka (2014) show that market conditions and managerial behavioral biases, in particular the "disposition effect", have a significant impact on the speed of the IPO process. The study shows a negative correlation between market returns and the length of the IPO process: firms tend to accelerate their IPOs in hot markets to take advantage of rising valuations, while they postpone them in cold markets in the hope of recovering higher valuations. Importantly, the correlation is strongest before the IPO prospectus is approved, suggesting that managerial decisions play a crucial role in determining the timing of IPOs.

Plotnicki and Szyszka (2014) identify a clear pattern of post-IPO returns. Firms that rushed their IPO in a hot market received positive market returns compared to what they could have achieved if they had waited, while firms that delayed their IPO in a cold market received negative returns compared to an earlier potential issue. These findings suggest that managers often struggle with imperfect market timing due to biases aimed at capitalizing gains and avoiding losses. This behavior is not only consistent with prospect theory (Kahneman & Tversky, 1979), but also contributes to the concentration of IPOs in hot markets and the suboptimal timing of offerings in cold markets.

Underwriters play a crucial role in helping companies plan the timing of their IPOs. According to Lowry and Schwert (2002), underwriters provide strategic advice on when companies should issue shares by monitoring market conditions and investor sentiment. Their study highlights a clear link between IPO size and initial returns and shows that higher initial market returns often lead to an increase in IPO activity. This pattern reflects the fact that underwriters tend to encourage companies to go public during periods of strong market performance and positive sentiment, when demand for new shares is high. By arranging the issue during these favorable circumstances underwriters seek to ensure that the IPO achieves a higher valuation and greater liquidity to the benefit of both the issuing company and its early investors. Furthermore, the study shows that underwriters' timing strategies are not only reactive, but also involve the use of market signals and institutional networks to assess the optimal timing of IPOs. This proactive role underlines

the importance of underwriters in reducing the uncertainty associated with market entry, especially for firms that may not have the expertise or resources to independently assess market dynamics.

3 Sustainability and Finance

The integration of sustainable development into financial markets has gained significant ground in the past decades. A CEO survey by the UN Global Compact-Accenture in 2010 finds that 93% of the 766 CEOs surveyed worldwide considered Corporate Social Responsibility (CSR) to be a critical or very important factor in the future success of their organizations (UN Global Compact-Accenture, 2010). This chapter reviews the most relevant sustainability related terms and discusses whether sustainability is important for the existence of a company.

3.1 Environmental, Social and Governance

ESG is an umbrella term that made its first appearance in a UN report in 2004 and consists of three parts: environment, social and governance (UNGC, 2004). The environmental component looks at companies' interaction with the environment, the social component focuses on relationships with stakeholders and the governance relates to the internal practices of the firm. On the whole, ESG provides a framework for assessing companies beyond traditional financial metrics, such as income statement and balance sheet analyses, and offers investors additional criteria to assess companies' potential risks. In addition, investors are increasingly prioritizing ESG values in their decision-making and favoring companies that proactively consider these risks through ESG practices.

The term ESG disclosure is mentioned in almost every ESG-related study. In essence, it means disclosing companies' data on environmental, social and governance areas (Tsang et al., 2023). ESG disclosure allows investors to evaluate companies with lower financial risk by assessing their ESG practices. This information serves as a tool to make investing decisions and help investors avoid companies that may be subject to more stringent ESG regulations or risks associated with their ESG activities. In addition, ESG investing encourages companies to improve their ESG strategies and prioritize greater transparency and detail to meet investor expectations.

ESG scores, often referred to as ESG ratings, assess companies' risks and performances against environmental, social and governance criteria. ESG scores are available in different formats and scales and can be numeric or alphabetic. Different providers use different methodologies, for example, some ESG scoring systems use a scale of 0 to 100, where a higher score usually means better performance, but can also mean greater risk. Others use a scale of 1 to 10, with lower scores often indicating lower risk. Alphabetical grading, such as A to F is also common, with A usually meaning best performance. Identifying each provider's specific scoring system and methodology is critical for accurate comparisons and interpretations.

One challenge of ESG is that ESG scores are complex and may vary depending on the provider (Chatterji et al., 2015). Some providers collect information through surveys or questionnaires sent to firms, while others rely on public disclosures or a combination of both approaches. Furthermore, certain providers keep their scoring criteria confidential, which complicates understanding their evaluation processes. Naturally, this built-in problem of ESG makes comparing companies and research harder, underlining the importance of developing ESG measurement. Therefore, Chatterji et al. (2015) suggests that parties that use ESG ratings should be cautious with using these scores as an equivalent of real-world CSR.

According to Zhang (2022), ESG greenwashing undermines ESG reliability. He states that ESG greenwashing can affect returns negatively due to unnatural distortions. Inaccurate ESG disclosure creates more information asymmetry that is connected to higher underpricing (Pei-yi Yu et al., 2020). In particular, greenwashing can be used as a strategic tool to mislead external credit rating agencies and exploit information asymmetries. By acting in this way, firms try to create refined ESG disclosure, while their actions create asymmetric information (Zhang, 2022).

Research conducted by Pei-yi Yu et al. (2020) show that ESG data presented in corporate sustainability reports is often unaudited, raising concerns about its reliability. If the

published ESG data is not credible, it can create a barrier between ESG data and investment decisions. Furthermore, the authors describe companies that provide seemingly transparent ESG information but report low ESG scores as “greenwashers”. The authors present evidence that greenwashing behavior related to ESG dimensions can be mitigated by a number of factors, including oversight by independent directors, monitoring by institutional investors and having lower levels of corruption in the country systems.

3.2 Corporate Social Responsibility

While CSR and ESG are often regarded as equivalent, they differ in their scope and focus. CSR emphasizes voluntary efforts by companies to support social and environmental issues when ESG is a broader framework used by investors to assess a company's environmental, social and governmental impact (Amel-Zadeh & Serafeim, 2018). In contrast to CSR, ESG integrates measurable metrics and reporting standards to help investors assess risks and opportunities associated with sustainability factors. Furthermore, where CSR can be seen as a self-regulatory model for companies to pursue social benefits, ESG serves as an investment decision-making tool to ensure that companies address long-term sustainability risks in a way that is aligned with financial performance.

According to Hillman and Keim (2001), CSR is often misinterpreted to stakeholder theory. Phillips et al. (2003) state that the distinction between stakeholder theory and CSR remains crucial in business disciplines, as many researchers still do not consider stakeholder theory as a key management framework. This rejection is often due to the misconception that stakeholder theory is synonymous with CSR, which leads to it being seen as optional. In reality, according to previous literature as earlier discussed, following stakeholder principles allows companies to create greater value, including economic value (Post et al., 2002; Dhaliwal et al., 2011).

Measuring CSR has traditionally been more subjective compared to ESG. Unlike ESG, that is measured based on standardized frameworks and quantitative data, CSR lacks universally agreed measurement criteria (Kaźmierczak, 2022). Agencies such as MSCI,

Sustainalytics and LSEG, which offer ESG ratings, may include CSR elements in their broader ESG frameworks, but their methodologies may differ significantly from each other. All in all, ESG metrics are increasingly standardized and used in investment decisions when CSR performance remains open to interpretation and is often driven by stakeholder-specific expectations rather than universal benchmarks.

3.3 Shareholder and Stakeholder Theories

The debate between shareholder and stakeholder theories has been central to understanding corporate priorities and integrating environmental, social and governance considerations into corporate operations. Friedman (1970) writes in his assertion that the primary role of a firm is to maximize its shareholder value. This role has been viewed as the primary objective for businesses and opposes the allocation of resources to social or environmental initiatives unless they directly improve profitability.

Many studies that support shareholder theory argue why stakeholder theory is not an appropriate objective for a company or a strong enough reason to justify its existence. Jensen (2010) argues that stakeholder theory should not be considered a viable alternative to value maximization because it lacks a clear and complete definition of corporate purpose or an objective function. He emphasizes that while value maximization offers corporate managers a single and clear objective, stakeholder theory requires them to address the needs of multiple stakeholders simultaneously. This creates a scenario where managers are attempting to serve "many masters," which ultimately leads to inefficiencies and compromises, leaving all parties inadequately served. Sundaram and Inkpen (2004) continue to advocate shareholder value maximization as the most effective and sustainable corporate objective, as it is aligned with the long-term value creation of multiple stakeholders. They argue that criticisms of shareholder value maximization are often wrongly attributed to shareholder-centricity, when in reality problems exist regardless of which stakeholder is prioritized. To conclude, shareholder theorists argue that a company must have a clear objective, and there is no evidence why creating shareholder value is not a good primary objective for a company. In addition, they stress

that focusing on shareholder value increases value for stakeholders more than focusing equally on stakeholders, which is why shareholder theory is superior to stakeholder theory.

In contrast to Friedman (1970), Freeman's (1984) stakeholder theory requires companies to consider the interests of a wider group, including for instance, employees, customers, communities and the environment. This broader perspective is consistent with modern ESG principles, which emphasize balancing economic performance with sustainable and ethical practices (Cheng et al., 2014). Stakeholder theory is considered practical, since all companies must manage stakeholders (Harrison et al., 2015). Treating stakeholders well creates a beneficial environment where stakeholders have a positive attitude towards the organization. For instance, customers are more likely to buy products or services, communities may offer tax incentives, financiers may offer favorable terms and shareholders may increase their investments. In addition, employees tend to show greater loyalty and commitment even in challenging times.

Post et al. (2002) stress that mutually beneficial stakeholder relationships enhance the wealth creation capacity of a firm. This trust acts as a kind of "social glue and grease" that ensures smoother operations and reduces conflicts with stakeholders that can be costly to resolve. The authors also argue that effective stakeholder management can act as a form of insurance that allows firms to cope with crises more effectively. By aligning stakeholder interests with corporate strategies, companies not only reduce risks, but also achieve long-term financial sustainability and survive in competitive markets.

Stakeholder theory has faced several critical distortions as well as unintentional misinterpretations that have affected the credibility and support of stakeholder theory (Phillips et al., 2003). Table 1 assembles some of the most common misconceptions about stakeholder theory. As can be seen, stakeholder theory is linked with, for instance, socialism, equality and moral doctrines. However, stakeholder theorists point out that these misunderstandings are due to misunderstandings of the meaning and scope of the

theory. Stakeholder theory is not about promoting socialism, moral lessons or treating all stakeholders equally without context. Instead, it is a pragmatic management approach that focuses on creating value for all stakeholders in a way that enhances the success and sustainability of the organization.

Table 1. Common misconceptions about stakeholder theory (Phillips et al., 2003).

Critical Distortions	Friendly Misinterpretations
Stakeholder theory is an excuse for managerial opportunism (Jensen 2000; Marcoux 2000; Sternberg 2000)	Stakeholder theory requires changes to current law (Hendry 2001a, 2001b; Van Buren 2001)
Stakeholder theory cannot provide a sufficiently specific objective function for the corporation (Jensen 2000)	Stakeholder theory is socialism and refers to the entire economy (Barnett 1997; Hutton 1995; Rustin 1997)
Stakeholder theory is primarily concerned with distribution of financial outputs (Marcoux 2000)	Stakeholder theory is a comprehensive moral doctrine (Orts and Strudler 2002)
All stakeholders must be treated equally(Gioia 1999; Marcoux 2000; Sternberg 2000)	Stakeholder theory applies only to corporations (Donaldson and Preston 1995)

4 Reasons for Underpricing

Theories based on information asymmetry argue that the primary reason for underpricing is the imbalance of information regarding the issuer's true value between the issuing parties. Keloharju (1993) finds evidence from Finland and affirms the existence of winner's curse. His paper argues that investors that place large orders in IPOs suffer the winner's curse and lose money in most allocations, while investors that place small orders achieve higher returns on allocations in general. He further argues that the winner's curse plays a significant role in explaining underpricing.

Koh and Walter (1989) support the existence of winner's curse in their study of 66 IPOs in Singapore. In Singapore, allocations are done with a random ballot and investors have an equal chance of receiving the shares. The authors find that underpricing falls from 27% to 1% when a random ballot allocates securities compared to a quantity-based system. Thus, if reducing the impact of the winner's curse in allocation strongly influences initial returns, one can conclude that it is the primary reason for underpricing. Further evidence shows that in Israel uninformed investors experienced negative allocation-weighted initial returns in early 1990s (Amihud et al., 2003). The mean initial returns of IPOs were 12% while amongst uninformed investors the average initial return were merely -1,2%.

Ritter (1984) suggests that the higher the underpricing, the more there has been ex ante uncertainty. Therefore, underpricing can be seen as a premium for investors which dare to invest in companies whose true values are uncertain. Ljungqvist (2007) reminds that Ritter's (1984) suggestion has received a major amount of empirical support in financial literature. He adds that not only winner's curse, but all information asymmetry-based theories assume that underpricing has a positive relation with ex ante uncertainty. Hence, empirical studies have a hard time controlling the prior uncertainty in whatever hypothesis they try to test. Information asymmetry is in general hard to measure due to its inherently unobservable nature.

Underpricing can be considered an unavoidable cost for firms listing on the market. This view suggests that firms have incentives to diminish costs of information asymmetry between uninformed and informed investors who cause underpricing. Habib and Ljungqvist (2001) argue that issuers are willing to take expensive actions in order to reduce underpricing up to a point where the cost of these actions equals that of underpricing. Note-worthy, this marginal profit is not calculated by means of underpricing, but in the wealth losses underpricing causes issuers. The authors find evidence that by optimizing an additional dollar to deduct underpricing it lessens wealth losses by 98 cents. However, the benefits of optimizing issuance this way are so minimal that they can be considered negligible.

Signaling theory offers a widely accepted explanation for the underpricing of IPOs. According to Welch (1989), firms may deliberately underprice their IPOs in order to leave a positive impression on investors and increase the likelihood of success in future offerings. High-quality firms are more likely to use this strategy because they have lower communication costs than lower-quality firms, which risk exposure and higher reproduction costs. Empirical support for this view comes from Welch's analysis of initial public offerings between 1977 and 1982, which shows that firms using this signaling strategy were more successful in raising capital through subsequent seasonal share issues. Furthermore, Allen and Faulhaber (1989) argue that underpricing acts as a quality signal, especially during hot issues, when good firms are better able to cover initial losses. Slovin et al. (1994) find that underpricing can help reduce negative market reactions during seasonal share issues. Moreover, Cornanic and Novak’s (2015) research presents evidence from Polish markets that firms underprice because they want to be appealing investment targets in later SEOs. The authors find out that higher underpricing leads to bigger probabilities to execute SEOs in three years after IPO dates. Additionally, they find out that these later equity offerings are more sizable, and they are executed faster. Overall, signaling theory assumes that firms use underpricing to communicate quality information to investors when information asymmetries are large.

Listing firms have two possible paths to reduce the principal-agent problem. They can supervise the motivation of the investment bank towards IPOs and, based on these findings, try to negotiate a reasonable offering price (Ljungqvist, 2007). Alternatively, they can design a contract that directs the incentives of the investment bank in a direction favorable for them, for instance, by making the compensation system beneficial for both. Ljungqvist and Wilhelm (2003) find empirical proof from the U.S. about overseeing the investment banks motivation for selling. They provide evidence that greater oversight of incentives leads to lower underpricing.

Baron (1982) suggests that a way to lessen the effects of agency conflicts is by tying investment bank compensation more closely to the valuation of issuers. Ljungqvist's (2003) research from the U.K. supports Baron's (1982) suggestion. He finds that between the years 1991 and 2002 issuers that signed contracts with higher commissions with their investment banks experienced lower underpricing. In other words, issuers that paid higher commissions to underwriters experienced lower initial returns in the first trading days. These results provide evidence that listing companies' contracts with investment banks does affect pricing behavior of investment banks. One can conclude that while these findings provide evidence for the existence of principal agent problem, they also show that this issue could be avoided with the use of these contracts.

Ljungqvist and Wilhelm (2003) remind there are situations where investment banks are pre-IPO shareholders of their IPO clients. When an investment bank owns a company it is taking public, its incentive is to underprice to an extent that does not harm itself. The author's research sample shows evidence that investment banks were owners in 44% of firms issued by the year 2000. Therefore, it can be argued that because investment banks are owners in almost half of the IPOs, many IPOs are underpriced for some other reason than investment banks. Furthermore, on some rare occasions, firms can be underwriters for their own IPOs, for instance, in IPOs of investment banks. Muscarella and Vetsuypens (1989) examine 38 investment banks that went public in the years 1970 to 1987. They find that the initial returns of these investment banks are practically the same as with

normal IPOs. Therefore, it can be stated that in situations where the investment bank and the listing firm are the same, the principal-agent problem should not exist.

Loughran and Ritter (2002) argue that the real cause for underpricing is the incentives of investment banks to underprice IPOs. The authors mention that by underpricing IPOs investment banks may benefit from the unnecessary money left on the table by allocating these securities to their buy-side clients that are typically hedge funds or pension funds. Beatty and Ritter's (1986) paper on the reputation of investment banks backs up the view that underwriters are the real cause of underpricing. They remind that investment banks who underprice too much lose issuers while investment banks who do not underprice enough lose investors. Thus, investment banks always have a risk of losing reputation if they price incorrectly. Noteworthy, issuing firms only get to go public once in their life span, making their word less relevant in the debate about the actual offer price against the experienced investment bank. This is one of the reasons why investment banks can enforce underpricing even though the issuing company is reluctant to leave money on the table. The authors add that if investment banks cheat the underpricing equilibrium often, it will not be left unnoticed by the market and the investment banks will be castigated.

It is customary that investment banks act as underwriters in IPOs. Because underwriters have to bear the risk of failure in the IPO, investment banks have incentives to take actions to mitigate the realization of this risk. A key strategy to accomplish a successful IPO is to get it oversubscribed. Obviously, the best way to get an IPO oversubscribed is by underpricing it. When IPOs are oversubscribed the demand for securities is high. On the contrary, the demand for undersubscribed IPOs is low. Undersubscription can damage investment banks because they have agreed to purchase the remaining shares as underwriters. When IPOs are undersubscribed and thus usually overpriced, underwriters are left responsible for the losses that occurred due to the IPO (Daily et al., 2003). In these occasions, underwriters are left holding overpriced shares that are hard to sell without an after-market discount that leads to losses.

Ritter and Welch (2002) compare reasons that cause underpricing and conclude that even though information asymmetry theories have been dominant theories explaining underpricing in financial literature, these theories may have been overemphasized over time. However, there is no significant proof that some other model is the primary reason for underpricing. Therefore, it could be concluded that there might be no single model that alone can explain underpricing. Also, it can be argued that it is impossible for information to ever be evenly distributed among all issuing parties. The more uncertainty about the real value of the company, the more there is information asymmetry between parties.

5 SRI, ESG and Returns

Several institutional investors believe that stakeholder relationships are associated with firm value in a way the financial markets fail to understand (Borgers et al., 2013). Still, investors are increasingly incorporating ESG criteria into their investment decisions, thus emphasizing that their objectives align with the well-being of stakeholders and society at large. Additionally, many of these investors believe that ESG factors have a positive impact on long-term investment performance, underlining the significance of socially responsible and ESG investing decisions.

The compatibility of ESG criteria with corporate financial performance (CFP) has been a core topic of debate among academics for over 40 years (Friede et al., 2015). There are many studies that claim there to be a positive ESG-CFP relation (Friede et al., 2015; Yu, 2024), however some argue that the results in these studies are inconsistent or inconclusive (Aupperle et al., 1985; Rowley & Berman, 2000; Revelli & Viviani, 2014). Figure 3 illustrates the correlation between E, S and G categories to CFP from 644 studies (Friede et al., 2015). The strongest correlation is observed in governance with 62,3%. On the contrary, governance possesses the strongest negative correlation with 9,2%. In addition, both environmental and social factors show a strong positive relationship with 58,7% and 55,1% positive correlation, respectively. At the same time, negative correlations are relatively low. Interestingly, when the combinations of E, S and G are considered together, the strength of the positive correlation drops to 35,3%. This suggests that individual dimensions may have a clearer impact on firm performance than the combined ESG measures. Overall, the figure shows that governance is the most influential factor for both positive and negative relationships.

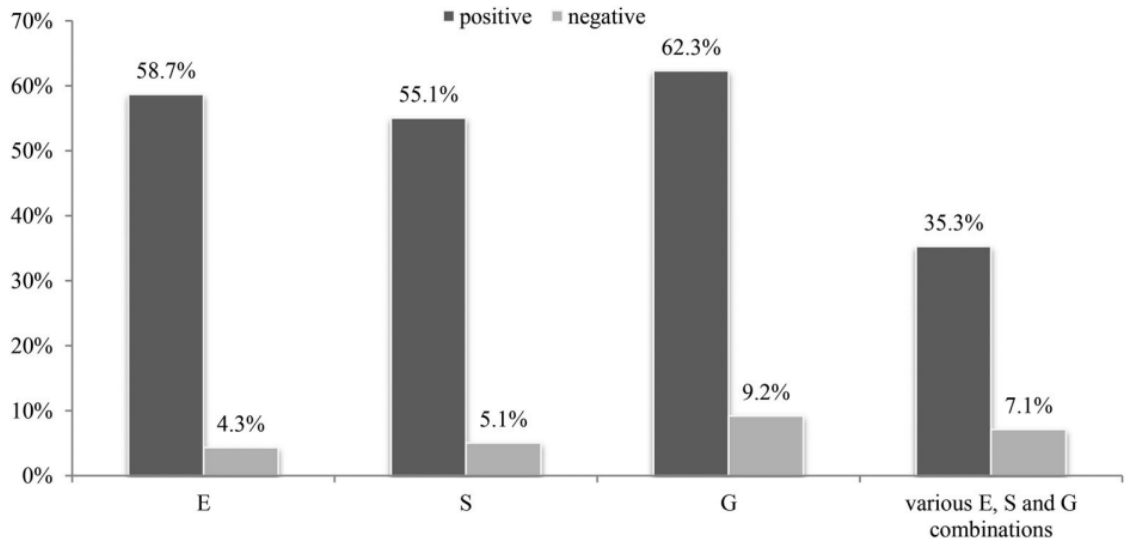

Figure 3. The correlation between ESG components and CFP (Friede et al., 2015).

A review done by Whelan et al. (2021) of over 1 000 studies published between 2015 and 2020 shows a positive relationship between ESG and financial performance. Among corporate-focused studies examining metrics such as ROE, ROA, and stock price, 58% found positive results, 13% reported neutral impacts, 21% showed mixed findings, and only 8% indicated negative outcomes. For investment-focused studies, which analyzed risk-adjusted metrics like alpha and the Sharpe ratio, 33% identified positive performance, 26% found neutral impacts, and 14% reported negative results, with 59% performing as well as or better than conventional approaches. Additionally, climate-focused studies provide similar trends, with 57% of corporate studies and 65% of investor studies reporting positive or neutral outcomes, while negative findings remained under 14% across categories. Figure 4 further illustrates the paper's results.

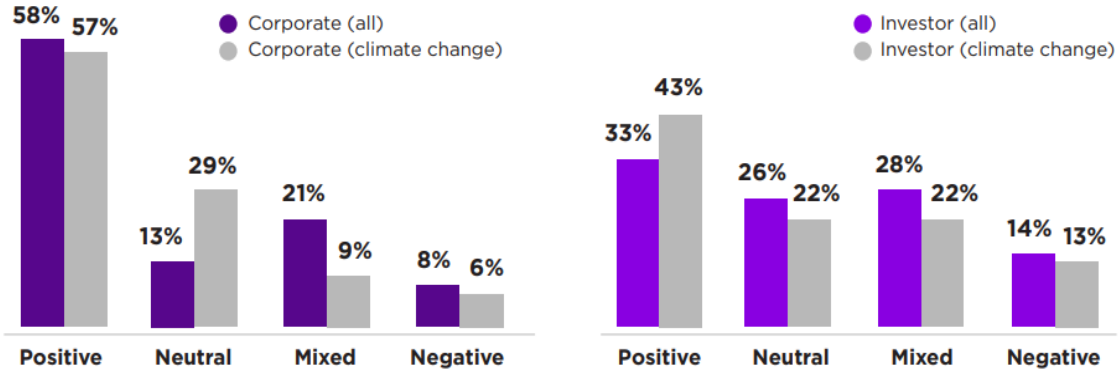

Figure 4. Correlation between ESG and financial performance (Whelan et al., 2021).

Socially responsible investing (SRI) has had a measurable impact on portfolio returns, and there is evidence of its ability to generate significant abnormal returns. Kempf and Osthoff (2007) show that portfolios constructed using positive or best-in-class screening practices that emphasize the selection of stocks with high SRI ratings achieve superior financial results. For instance, a trading strategy of buying high SRI stocks and selling low SRI stocks generates abnormal returns of up to 8,7% per year. A best-in-class screening method that rebalances investments across industries is particularly effective when combined with multiple SRI screenings such as employee relations, community impact and environmental factors. Moreover, Ademi and Klungseth (2022) provide evidence that firms with high ESG performance produce better financial performance and higher market valuation than firms in the same industry. Furthermore, their study points that firms with superior ESG performance experienced positive impact during COVID-19, indicating that elite ESG performance enables companies to thrive in time of global crises.

According to Friede et al. (2015), investor perceptions may be influenced by portfolio studies, which typically show a neutral or mixed relationship between ESG and CFP. Their comprehensive review of over 60 studies, including more than 3 700 results from over 2 200 primary studies, provides strong evidence on the profitability of ESG investing. Against common investor perceptions, company-specific studies overwhelmingly show a positive relationship between ESG and CFP. Portfolio studies, which represent only a fraction of the literature in this topic, are often influenced by risk and implementation costs. In particular, the potential for excess returns under ESG is significant in North

America, emerging markets and non-equity asset classes. Also, positive correlations have remained stable since the mid-1990s.

An analysis of the correlation between ESG scores and return on equity (ROE) of U.S. companies from 2008 to 2018 yielded mixed results (Statista Research Department, 2022). While companies ranked in the lowest 20% of ESG scores appeared to achieve higher ROE, the results were more significantly affected by differences in ESG scoring methodologies across providers. In several cases, the choice of ESG framework had a greater impact on the variation in ROE than the ESG scoring itself, highlighting the inconsistency of ESG measurement.

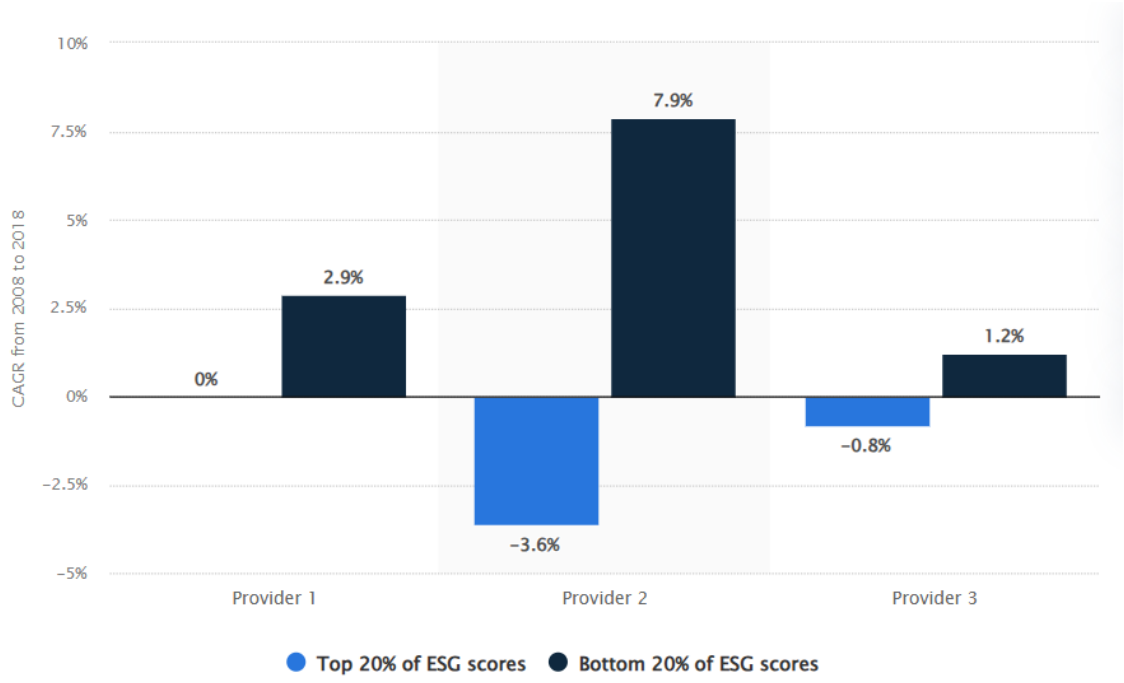

Figure 5. CAGR of ROE in U.S. companies between 2008-2018 segmented by top and bottom ESG scores (Statista Research Department, 2022).

Cheng et al. (2014) provide further results that companies that follow stakeholder principles achieve better long-term performance. They find that increased ESG disclosure increases transparency and stakeholder trust, which in turn improves corporate reputation. The authors argue that by addressing the needs of multiple stakeholders, firms can

reduce the risks associated with poor governance or environmental negligence, leading to lower capital costs and improved operational efficiency. Amel-Zadeh and Serafeim (2018) continue by highlighting that institutional investors view ESG integration as beneficial for financial performance, in contrast to the historical skepticism of shareholder theorists. Their results show that 82% of the investors surveyed believe that ESG information is financially relevant, reinforcing the argument that taking stakeholders' interests into account is aligned with maximizing shareholder value.

However, not everyone finds a positive correlation. The results presented by Halbritter and Dorfleitner (2015) are opposite. The authors find that ESG portfolios do not generate different returns depending on the size of the ESG rating. In the paper, although Fama and MacBeth (1973) cross sectional regressions indicate evidence of a strong correlation of ESG variables and returns, investors tend to be unable to exploit this relation. They add that the dependence of the relationship is largely due to the ESG rating provider, specific subperiod as well as the sample of firms. The paper argues that investors should not expect abnormal returns depending on high or low ESG scores.

Revelli and Viviani (2014) continue with mixed results. They find that including CSR into investment portfolios neither benefit nor undermine the financial performance of the portfolios. On the other hand, they identify that there is no additional cost in investing socially responsible. According to the authors, the final performance depends more on the investing methodologies and the ability of the portfolio manager to create value. Aupperle et al. (1985) report varying results as well. They find that while several studies show a positive correlation, the methodologically most sound studies end in opposite results. Furthermore, to support their findings, their own research also finds no positive correlation.

6 ESG and IPO

The inclusion of ESG disclosure in listing strategies plays a key role in improving long-term survival rates and reducing the risk of failure for newly listed companies (Fu et al., 2023). Early ESG disclosure reduces information asymmetry (Tetlock, 2010), attracts investor attention (Barber & Odean, 2008) and increases trading volume (Berry & Howe, 1994). These findings indicate that early ESG disclosure can contribute to IPO success. In addition, companies with stronger ESG performance, specifically in social and governance performance, have lower failure rates as these factors signal stakeholder trust (Fu et al., 2023). Moreover, companies which disclose ESG information promptly after their IPO tend to have higher long-term returns. However, the authors warn that ESG initiatives can impose significant costs especially on small or younger firms, which may worsen agency problems and financial pressure. Despite these challenges, the additional information provided by ESG disclosure increases the legitimacy of companies and reduces the lack of information for investors, thereby deducting risks and improving market viability.

Fu et al. (2023) research consists of a sample of 1 102 U.S. IPOs from 1999-2016. The findings suggest that voluntary ESG disclosure decreases the risk of IPO failure and improves long-term performance. Additionally, disclosure of ESG data earlier after an IPO increases the probability of survival and improves long-term performance. Lastly, IPOs with higher ESG scores are less prone to failure. Ferri et al. (2023) add that that companies which release sustainability reports are viewed as less risky because investors recognize ESG disclosure to mitigate risks. Furthermore, the authors find that publishing a sustainability report before an IPO reduces underpricing. All in all, the evidence suggests that ESG disclosure is an important tool to overcome the complexities of IPOs and achieve success in the listing process.

Some studies show that ESG momentum portfolios tend to outperform benchmark indices (Nagy et al., 2016; Giese et al., 2019). Furthermore, Aydoğmuş et al. (2022) provide evidence that ESG rating is positively and significantly correlated with firm value. They

find that social and governance ratings have positively significant correlations, while the environment score alone does not have notable correlation. There are several possible explanations for the inverse correlation with environmental ratings. For example, high investment costs and the extended time required to realize the benefits of environmental investments may play a significant role. Narula et al. (2024) provide similar results of a negative significant relationship between the environment score and firm performance. Additionally, their study provides evidence that there is no significant relationship between social score and firm performance, and a positive significant relationship between the governance score and firm performance. After statistically adjusting for firm-specific variables such as book to market value, leverage and growth, these variables were found to have a negative significant effect on firm performance, while firm age had a positive effect.

Naeem et al. (2022) find that ESG score and separate E, S and G components all correlate positively and significantly with firm value. Therefore, companies with high ESG ratings have lower firm discount rates leading to growth in firm value. Moreover, firm value is influenced by investors' perceptions of sustainability (Derwall & Verwijmeren, 2007). As a result, companies with strong ESG performance tend to achieve higher market valuations. Also, Wang and Xu (2023) state that IPO issuers that actively follow ESG practices receive higher ESG scores and thus contribute to price stability meaning that there is less underpricing.

In contrast, Schmunkamp (2025) finds that ESG has a positive coefficient with IPO underpricing. This means that a higher ESG score increases underpricing, rather than decreases it. Economidou et al. (2022) continues by finding strong evidence that companies with an ESG rating prior to listing experience higher underpricing. This reaction appears to reflect a market reaction to the value of the ESG signal. ESG rated firms tend to have higher abnormal returns after listing and have better long-term financial performance than non-rated firms. These firms also face lower agency costs.

7 Data and Methodology

This chapter describes the data and methodology sections used in the empirical part of this thesis. The methods used for testing hypotheses are also explained.

7.1 Data Description

The dataset used in this study consists of U.S. IPOs issued between 2010 and 2023. The data is collected from databases provided by London Stock Exchange Group (LSEG), more specifically, IPO data is from SDC Platinum database and ESG data from Datastream. ESG ratings are between 0 and 100 where a higher number indicates a better ESG score. Table 2 presents more detailed explanations for each quantile. The study focuses exclusively on companies listed primarily on the major U.S. exchanges, such as NASDAQ and the New York Stock Exchange (NYSE). In order to provide a consistent measure of IPO under-pricing, the sample excludes atypical IPO structures such as American Depositary Shares (ADSs), equity and other nontypical share offerings that could distort post-issuance price behavior.

Table 2. ESG rating ranking (LSEG, 2025).

Score range	Description	
0 to 25	First Quartile	Scores within this range indicates poor relative ESG performance and insufficient degree of transparency in reporting material ESG data publicly.
> 25 to 50	Second Quartile	Scores within this range indicates satisfactory relative ESG performance and moderate degree of transparency in reporting material ESG data publicly.
> 50 to 75	Third Quartile	Scores within this range indicates good relative ESG performance and above average degree of transparency in reporting material ESG data publicly.
> 75 to 100	Fourth Quartile	Score within this range indicates excellent relative ESG performance and high degree of transparency in reporting material ESG data publicly.

The data sample consists of 711 companies. Of these, 301 companies have an ESG score in the year of listing and the rest have a score afterwards. Since all firms must have an ESG rating at some point, the sample size is quite small compared to the total amount of IPOs launched in the U.S. during 2010-2023, being 3966 in total (Stock Analysis, 2025). In total, there are companies from 12 different macro sectors, which can be seen in figure 6. As illustrated, healthcare companies make the largest group, followed by technology companies with less than half the count.

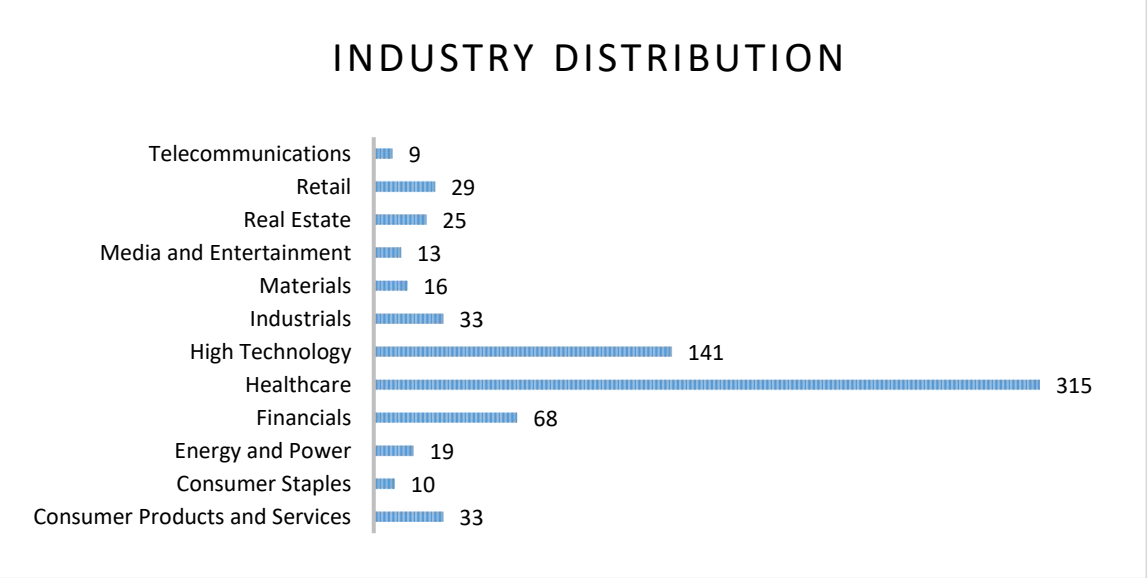

Figure 6. Number of IPOs by industries in the data sample.

For the period covered in this study, one can note that by far the highest number of IPOs occurred in 2020 and 2021, 2021 being the highest number of IPOs per year in history (Mackintosh, 2022), while the lowest number of companies went public in 2016 and 2023 as figure 7 illustrates. The hot and cold IPO markets in this study are defined based on the total number of IPOs per year across the U.S. market, rather than based only on the IPOs in the data sample. This approach provides a broader and more objective view of overall market activity, reducing the risk of bias caused by the sample selection criteria of the data sample. Using the full market count ensures that market heat classifications

reflect actual market-wide issuance trends, not just the firms included in this study. Based on these considerations, this thesis classifies 2014, 2020, and 2021 as hot years, whereas 2016, 2022, and 2023 are classified as cold years. This means that in the data sample, 297 firms issued in hot period, when only 35 companies issued during cold periods.

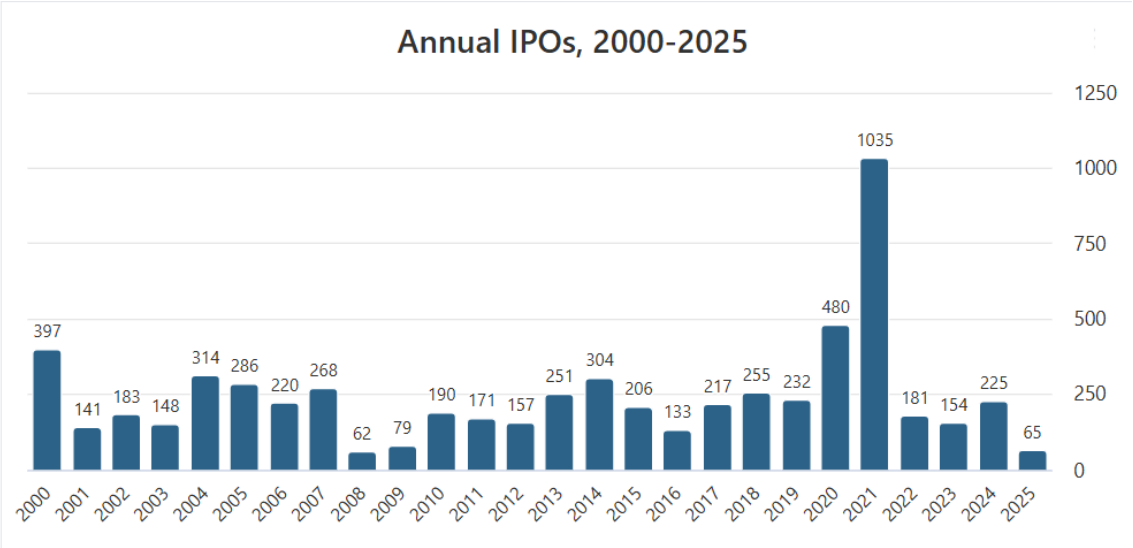

Figure 7. Number of IPOs in the U.S stock market in 2000-2025 (Stock Analysis, 2025).

As known from previous literature, underpricing levels tend to rise in hot markets (Ritter, 1984; Ljungqvist & Wilhelm, 2003). Figure 8 presents the average first-day underpricing in the data sample. As can be seen, underpricing is persistent. Underpricing peaks in 2020-2022, which was a period of exceptional activity in the IPO market as noted previously. By comparing figures 7 and 8, we see that underpricing progresses with the number of IPOs aligning with the findings of Ibbotson and Jaffe (1975). However, the relationship is not entirely linear, and there are exceptions in certain years. This suggests that while IPO activity and underpricing tend to move together, other factors such as investor sentiment and firm-specific characteristics also play an important role in shaping IPO pricing. Overall, the data used in this thesis reflects the IPO market as a whole. However, it is worth noting that there are some limitations in the data sample, for instance, caused by the requirements of ESG data.

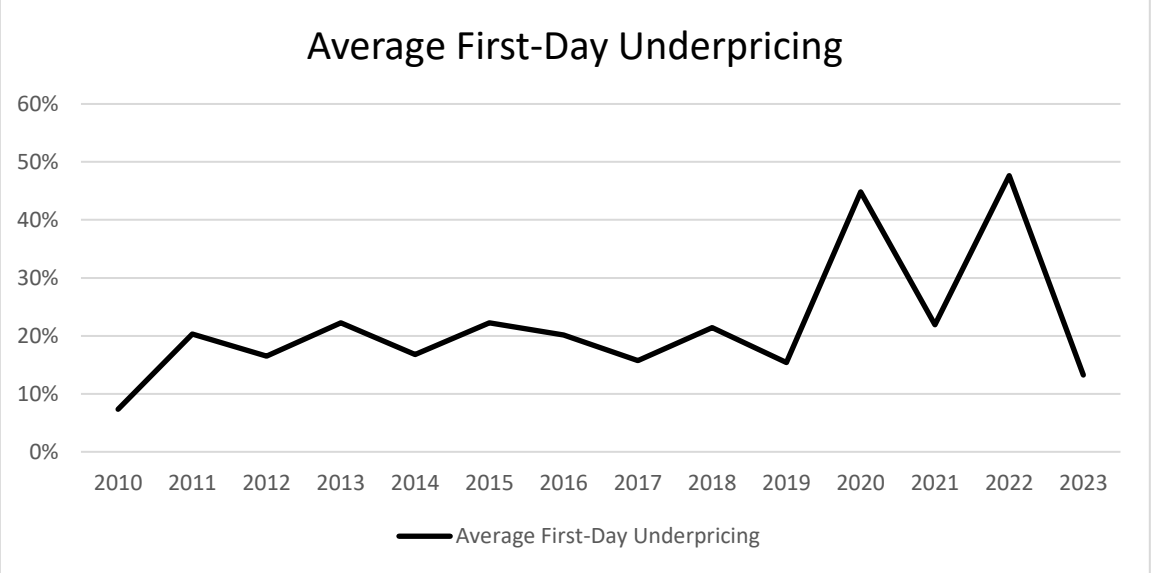

Figure 8. Average first-day underpricing of IPOs in the data sample.

7.2 Variables

In this section, the dependent variables are first introduced, following with the independent variables as well as the control variables. Each variable is presented together with its theoretical justification and relevance to the research hypotheses.

7.2.1 Dependent Variables

The aim of this thesis is to test the effects of ESG disclosure on underpricing. To test the hypotheses formed based on theory and previous literature, the dependent variable in this paper is IPO underpricing. It is tested in six different periods from the first day to one year. Therefore, this thesis is able to illustrate not only the short-term effects of underpricing but also the longer-term influence. The dependent variable is the same for all tests of hypotheses, since underpricing is the object of study in all hypotheses.

Research on underpricing has been popular in the history of financial academia and has yielded many results, but in summary, IPOs are on average underpriced. Dolvin (2013) states that IPOs are typically underpriced 15-20%, making it one of the most significant

costs associated with IPOs. This finding aligns with the work of Ritter and Welch (2002), who analyze U.S. IPOs from 1980 to 2001 and report a mean first day underpricing rate of 18,8%.

Underpricing is measured with the difference between the closing price at time T and the offer price, divided by the offer price (Certo et al., 2001; Chan et al., 2004; Filatotchev & Bishop, 2002) as illustrated below:

$$Underpricing\ T\ =\ \frac{Closing\ \mathrm{Price}\ at\ \mathrm{Time}\ T\ -\ Offer\ \mathrm{Price}}{Offer\ \mathrm{Price}}$$

7.2.2 Independent and Control Variables

As mentioned earlier in this thesis, ESG is a complex measure of the state of companies (Chatterji et al., 2015). As ESG is a relatively new issue, there are still differences in how it is measured between different rating providers. The ESG data for this study is retrieved from Datastream, a reliable provider offering one of the highest quality and comprehensive data found in the world (University of Vaasa, 2018). The ESG scores are between 0 and 100, 100 being the best possible value. In this thesis, all companies in the data sample have an ESG score, as well as separate environment, social and governance scores to examine the individual impact of each ESG component on underpricing (Cheng et al., 2014; Ioannou & Serafeim, 2011; Narula et al., 2024). These components and the combined ESG score act as independent variables in the study, measuring the influence of ESG on underpricing.

For hypothesis one, a dummy variable ESG Present is created. This variable indicates whether a company has an ESG score at the time of listing. This variable is used to investigate whether it is worthwhile for a firm to invest in obtaining an ESG score before issuing in order to reduce asymmetric information and thereby reduce underpricing. ESG

dummy variables are used in many ESG related studies (Asimakopoulos et al., 2023; Ferri et al., 2023).

Inspired by the approach of Yung et al. (2008) and Reber and Vencappa (2016) the impact of market conditions on the underpricing of IPOs is described by two dummy variables: the Hot Market and the Cold Market. The Hot Market variable is equal to one if the IPO takes place during a period of unusually high market activity. Conversely, the Cold Market variable is one if the IPO takes place during a quiet market period. If the IPO took place during a moderate or stable market phase, both dummy variables are zero, which is the base case. This classification allows the regression to isolate the differential effects of hot and cold market conditions on the underpricing of the IPO.

In hypothesis three, to examine whether the effect of ESG ratings on IPO underpricing varies across different market conditions, this study incorporates two interaction terms between ESG ratings and hot and cold dummy variables representing market conditions. The interaction term captures whether ESG ratings influence IPO underpricing differently during periods of higher market activity compared to quiet periods (Kong et al., 2024). The term is calculated by multiplying ESG score with hot or cold market dummy. The inclusion of these interaction terms is crucial as they allow the analysis to determine whether investors value ESG aspects more or less according to prevailing market conditions.

Firm size is a commonly used control variable in IPO related research because it reflects the perception that larger firms are more visible in the market and information is more available (Rock, 1986; Welch, 1989). According to this view, investors have a deeper understanding of the performance and prospects of larger companies, which leads to more accurate valuations because there is less information asymmetry. As a result, empirical studies often report a negative correlation between firm size and underpricing of IPOs, indicating that larger firms tend to experience less underpricing when they go public (Mauer and Senbet, 1992). The size of a company is measured by its total assets in this

thesis. The regression is run with the natural logarithm of total assets (Cheng et al., 2014, Ferri et al., 2023).

According to Ritter (1984), the age of a firm can be described as a measure of the difficulty of valuing the firm. More mature firms tend to have a wealth of historical information, which facilitates more accurate and consistent valuations. Conversely, younger companies with limited historical data are more difficult to evaluate, leading to a greater reliance on subjective assumptions. This increases the likelihood that analysts' estimates might differ. Furthermore, the variation in firm value between analysts, investors and underwriters can lead to larger differences between the offer price, increasing underpricing. In this study, the age of the company is calculated as the year between the IPO and the foundation year. The regression uses natural logarithmic values of company ages (Ferri et al., 2023; Loughran and Ritter, 2002).

The year 2021 was an extraordinary IPO year. Following the economic shocks of the COVID-19 pandemic in 2020, global capital markets rebounded strongly in 2021, which showed, for instance, by a record high IPO activity as shown in figure 8. The year 2021 is included as a control variable to take into account unique market conditions that may have contributed to the underpricing of IPOs in this period (Chambers and Dimson, 2009).

According to Loughran and Ritter (2002), high technology firms experience stronger underpricing at the end of the first day of trading compared to other industries. One explanation for this is that technology firms are often perceived risky compared to firms in other industries, usually because the valuation of technology companies is characterized by high prospects for the future (Lowry and Shu, 2002). Moreover, Siev and Qadan (2022) find that there is tendency with technology firms to issue at younger age compared to other sectors, which further supports the theory of higher underpricing by technology firms.

Table 3. Control variable interpretation.

Variable	Interpretation
Company Size	ln(Total Assets)
Company Age	ln(IPO year - Foundation year + 1)
Year 2021	Dummy variable for year 2021.
Industry Technology	Dummy variable for technology industry.

7.3 Descriptive Statistics

Before moving on to the research methodology and results, this chapter delves into the data used in this thesis through descriptive statistics. Descriptive statistics provide important information on the quality and quantity of the data sample by category. All variables are covered in this section. In order to make the data as interpretable as possible, the sizes and ages of firms are expressed as normal values, not as natural logarithms.

Table 4 presents the descriptive statistics for the dependent variables. The table reveals that the underpricing of the IPO is consistently positive in all observed periods, with the mean increasing from 0,220 on the first trading day to 0,323 one year after the issue. This suggests that, on average, the underperformance of IPO firms is persistent after the initial trading period. Ritter and Welch (2002) analyzed U.S. IPOs from 1980-2001 and reported that the average underpricing rate at the end of the first trading date was 18,8%, suggesting that underpricing levels are higher in this data sample. Furthermore, the distribution of underpricing is positively skewed across all time horizons suggesting extreme positive outliers or exceptionally well performing IPOs. Skewness is the highest after the first week of trading. Despite this, the median underpricing values remain positive throughout the sample, implying that typical IPOs, not just top performers, exhibit underpricing that lasts over time.

Table 4. Descriptive statistics for dependent variables.

	Underpricing 1D	Underpricing 1W	Underpricing 1M	Underpricing 3M	Underpricing 6M	Underpricing 1Y
Mean	0,220	0,240	0,267	0,333	0,263	0,323
Median	0,127	0,139	0,178	0,187	0,158	0,124
Maximum	3,500	5,912	2,293	7,721	6,249	6,123
Minimum	-0,348	-0,370	-0,954	-0,972	-0,963	-0,970
Std. Dev.	0,358	0,420	0,396	0,669	0,670	0,993
Skewness	2,801	4,841	1,428	3,607	2,563	2,432
Kurtosis	17,679	53,754	6,450	31,042	16,689	12,010
Observations	711	711	711	711	711	711

The descriptive statistics for the independent variables are proposed in table 5. First, the average ESG score of the firms is relatively low at 23,88, with the highest observed value being 74,22, indicating that the ESG performance of the firms in the sample is generally modest and widely distributed. This is consistent with the broader finding that ESG integration in issuing companies may still be in a developmental stage (Reber et al., 2021). Second, environmental scores are particularly poor, with a mean of only 4,817 and a median of zero. This means that more than half of the companies in the sample do not report any environmental score at all from the year issued, reflecting either a lack of environmental initiatives or low ESG disclosure. The average Social score is 33,717 which places it as the highest of the individual ESG components. However, the governance score is relatively close at 26,177. For market conditions, the mean of the hot market dummy is 0,418, which implies that around 42% of IPOs took place during a hot market. In contrast, cold market conditions are rare, with only 4,9% of IPOs executed during such a period, as reflected in the cold market dummy mean of 0,049.

Table 5. Descriptive statistics for independent variables.

	ESG Score	Environment Score	Social Score	Governance Score	ESG Present	Hot Market	Cold Market
Mean	23,876	4,817	33,717	26,177	0,423	0,418	0,049
Median	23,360	0,000	33,780	23,460	0,000	0,000	0,000
Maximum	74,220	68,620	79,190	80,860	1,000	1,000	1,000
Minimum	6,080	0,000	4,760	0,370	0,000	0,000	0,000
Std. Dev.	9,207	10,429	13,334	16,552	0,494	0,494	0,216
Skewness	0,829	2,638	0,296	0,887	0,310	0,334	4,167
Kurtosis	5,549	10,981	3,111	3,753	1,096	1,111	18,366
Observations	301	301	301	301	711	711	711

Table 6 illustrates the descriptive statistics for control variables. As can be seen from the table, the size of the company varies considerably with a mean of around 1,6 billion, but the distribution is highly skewed, with a median of only 145 million and a maximum of over 22 billion. This suggests that the average is influenced by a few very large firms. Moreover, the mean age of issuing companies is 10,1 years and the median 7 years. For comparison, according to Nasdaq (2022), the median age for issuing firms in 2021 was 11. Furthermore, 2021 was a very active IPO year globally and 10,8% of the observed IPOs occurred in that year. Lastly, technology companies represent almost a fifth of the sample, with an average value of 0,198. This indicates that while technology IPOs are significant, they do not dominate the data.

Table 6. Descriptive statistics for control variables.

	Company Size	Company Age	Year 2021	Industry Technology
Mean	1605,816	10,107	0,108	0,198
Median	145,300	7,000	0,000	0,000
Maximum	220850,000	100,000	1,000	1,000
Minimum	0,100	0,000	0,000	0,000
Std. Dev.	9266,918	12,942	0,311	0,399
Skewness	19,406	3,809	2,521	1,513
Kurtosis	445,610	21,113	7,355	3,290
Observations	711	711	711	711

Figure 9 provides information about the correlations between the independent and control variables in the data. As evident illustrates, ESG Score and Governance Score are strongly positively correlated, indicating that governance factors play an important role in determining the overall ESG rating of a company. Furthermore, Company Size and ESG score are weakly correlated, suggesting that larger companies may have slightly higher ESG scores. Hot Market and Year 2021 are strongly positively correlated, reflecting a significant increase in IPOs in 2021. Finally, Company Age and Hot Market are weakly negatively correlated, suggesting that younger firms are more likely to go public during hot market periods, while older firms may be less dependent on general IPO market conditions.

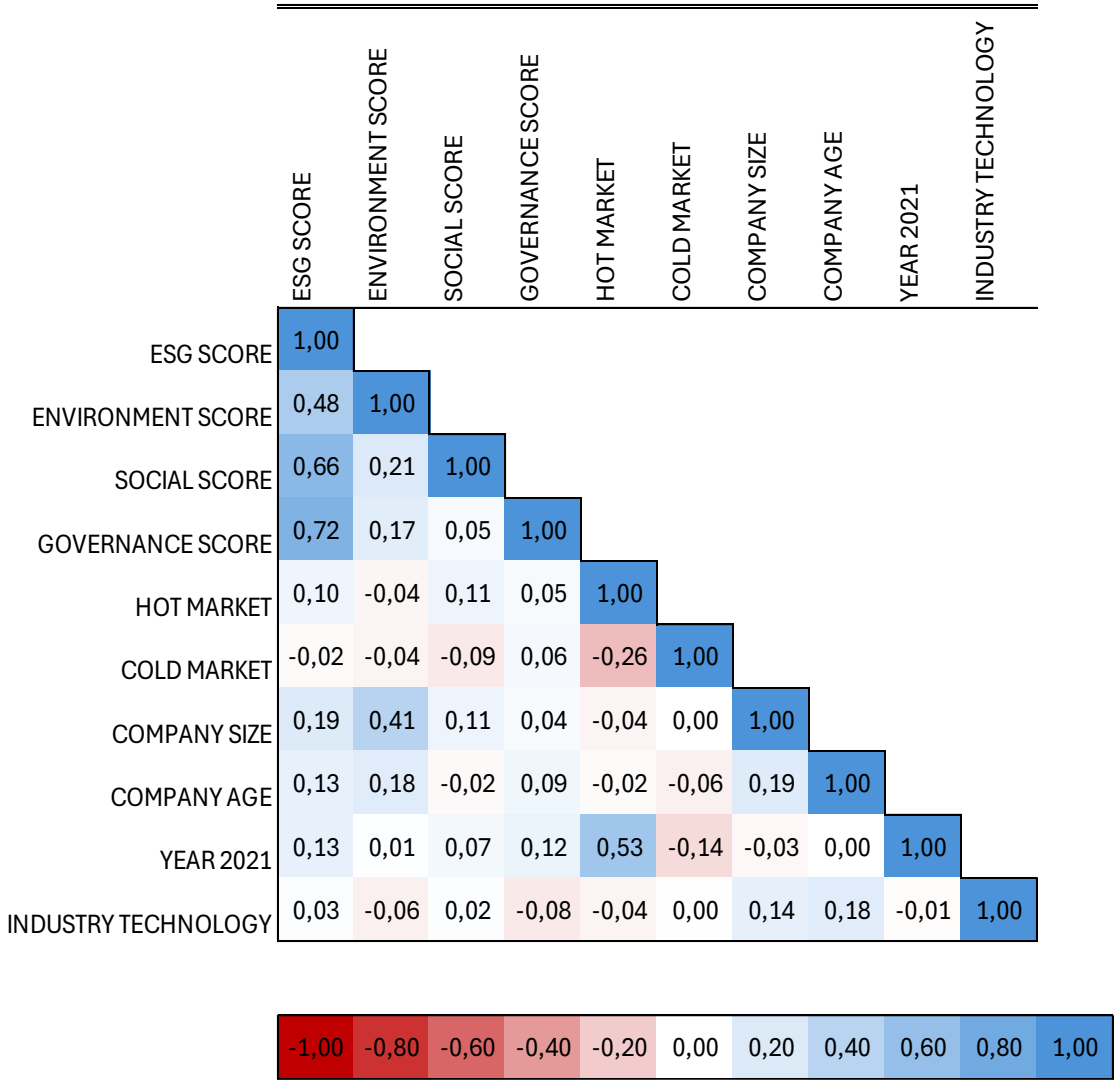

Figure 9. Correlation matrix for independent and control variables.

7.4 Methodology

To investigate the relationship between ESG factors and the underpricing of IPOs, this thesis uses Ordinary Least Squares (OLS) regression method. The method is used with three multiple regression models that are in line with the hypotheses presented. The models include underpricing as a dependent variable and use a combination of ESG indicators and firm-specific control variables to ensure robustness. Hot and cold market variables are not included in the first regression, since the idea is to only test if ESG matters. Therefore, adding hot and cold market variables could increase unnecessary noise.

The regression models used in this study are used in many IPO-related studies (Ferri et al., 2023; Loughran & Ritter, 2002). The regressions are run each of six times with different underpricing examination periods. By adding study specific control variables, the regressions become better appropriate for this paper.

The first model tests the effect of the presence of ESG scores on underpricing.

$$Underpricing_i = a_i + \beta 1 ESGPresent_i + \beta 2 CompanySize_i + \beta 3 CompanyAge_i + \beta 4 Year2021_i + \beta 5 IndustryTechnology_i + \varepsilon_i$$

The second model specifies the individual effect of ESG scores and their environmental, social and governance components to underpricing as follows:

$$Underpricing_i = \alpha_i + \beta 1 ESGScore_i + \beta 2 EnvironmentScore_i + \beta 3 SocialScore_i + \beta 4 GovernanceScore_i + \beta 5 HotMarket_i + \beta 6 ColdMarket_i + \beta 7 CompanySize_i + \beta 8 CompanyAge_i + \beta 9 Year2021_i + \beta 10 IndustryTechnology_i + \varepsilon_i$$

where in addition to the ESG components hot and cold market dummy variables are introduced.

The third model introduces interaction terms to assess how market conditions mitigate the relationship between ESG and underpricing. The model in question:

$$
\begin{aligned}
Underpricing_i \\
&= \alpha_i + \beta 1 ESGScore_i + \beta 2 EnvironmentScore_i + \beta 3 SocialScore_i \\
&+ \beta 4 GovernanceScore_i + \beta 5 HotMarket_i + \beta 6 ColdMarket_i \\
&+ \beta 7 (ESGScore_i \times HotMarket_i) + \beta 8 (ESGScore_i \times ColdMarket_i) \\
&+ \beta 9 CompanySize_i + \beta 10 CompanyAge_i + \beta 11 Year2021_i \\
&+ \beta 12 IndustryTechnology_i + \varepsilon_i
\end{aligned}
$$

which multiplies ESG scores with the hot and cold market dummy variables to test whether the effect of ESG score on underpricing differs depending on the market condition. Specifically, the interaction terms capture whether the relationship between ESG performance and underpricing is stronger or weaker during hot or cold IPO markets, compared to moderate ones.

8 Results

This chapter presents the empirical results of the thesis received using the three regression models designed to test the relationship between ESG and underpricing of IPOs. Each model is structured to answer a hypothesis. The results are organized thematically allowing a clear interpretation of how ESG factors interact with firm characteristics and wider market dynamics. Statistical significance of each hypothesis is discussed in detail. Moreover, the data does not exhibit multicollinearity problems as evidenced by the correlation matrix.

8.1 The Effect of ESG Presence on Underpricing

The first regression tests if firms with an ESG rating experience less underpricing in IPOs compared to firms without a rating. The evidence shown in table 7 reveals that ESG present is positive and statistically significant across all underpricing periods, indicating that having an ESG rating at the time of issuance increases underpricing. This finding is consistent across time horizons and robust at standard significance levels, and therefore, we cannot reject the null hypothesis. The findings are aligned with Economidou et al. (2022) and Schmunkamp (2025), who provide similar results. The evidence provided contradicts literature that reports information asymmetry to lessen underpricing. These studies state that having an ESG score at the time of IPO reduces underpricing rather than increases it (Fu et al., 2023; Ferri et al., 2023).

Table 7. The regression results with ESG Present.

Variable	Underpricing 1D	Underpricing 1W	Underpricing 1M	Underpricing 3M	Underpricing 6M	Underpricing 1Y
ESG Present	0,100***	0,129***	0,118***	0,224***	0,196***	0,162**
	(3,709)	(4,089)	(3,939)	(4,448)	(3,933)	(2,209)
Company Size	-0,023***	-0,022***	-0,017**	-0,039***	-0,040***	-0,035*
	(-3,493)	(-2,827)	(-2,346)	(-3,142)	(-3,193)	(-1,929)
Company Age	0,034**	0,039**	0,032*	0,026	0,021	0,042
	(2,264)	(2,220)	(1,923)	(0,948)	(0,754)	(1,038)
Year 2021	-0,022	-0,074	-0,068	-0,264***	-0,446***	-0,846***
	(-0,524)	(-1,480)	(-1,430)	(-3,809)	(-5,627)	(-7,248)
Industry Technology	0,092***	0,109***	0,101***	0,089	0,046	0,145
	(2,761)	(2,773)	(2,732)	(1,431)	(0,748)	(1,587)
Constant	0,219***	0,212***	0,233***	0,405***	0,387***	0,420***
	(4,721)	(3,902)	(4,527)	(4,678)	(4,502)	(3,316)
Observations	711	711	711	711	711	711
F-statistic	7,456	7,448	6,457	7,669	10,51	12,232
Prob(F-statistic)	0,000	0,000	0,000	0,000	0,000	0,000
R-squared	0,05	0,05	0,044	0,052	0,069	0,08
Adjusted R-squared	0,043	0,043	0,037	0,045	0,063	0,073
S.E. of regression	0,35	0,41	0,389	0,653	0,649	0,956

*****, **, and * show statistical significance at the 1 %, 5 %, and 10 % levels, respectively. The numbers in parentheses represent the t-statistics.**

According to the results, companies which have an ESG rating at the time of going public are underpriced more than companies without an ESG rating. Signaling theory suggests that companies signal quality to investors (Allen & Faulhaber, 1989). The assumption is that firms that obtain an ESG score before listing signal, for instance, transparency and provide additional valuation criteria to investors. Therefore, a strong level of underpricing can be driven by high quality. A further explanation for the results of this thesis could be that the market misprices ESG hype. Investors overreact to ESG news, leading to higher underpricing (Drogovoz et al., 2021). As a result, underpriced companies are not riskier as academic literature views (Ljungqvist, 2007) but provide a reason for the hype, which in this case is a ESG rating. Because of this, the initial offer price fails to capture the market enthusiasm towards the IPO, which is reflected as underpricing.

The regression provides other interesting results, for instance, firm-level characteristics play a crucial role in the outcome. In particular, firm size is negatively and significantly associated with underpricing in all time periods tested. This finding is consistent with previous literature that suggests that larger firms are perceived as more stable and less risky and thus experience less underpricing (Mauer and Senbet, 1992). In contrast, firm

age has a more limited and inconsistent effect. According to the results, older firms tend to be more underpriced, although the variable is significant only in the short-term between 1D to 1M. This indicates that firm age can affect initial valuation, but its explanatory power weakens after the IPO period.

The Year 2021 dummy variable becomes highly significant and negative starting from 3M period. According to the evidence, surprisingly, IPOs that are done in 2021 have a negative impact on the performance of the IPO. Moreover, Industry Technology variable has a positive and statistically significant effect on underpricing in the short-run, implying that technology firms tend to have higher initial returns than firms in other sectors, which is consistent previous literature (Loughran and Ritter, 2002). However, this effect weakens and becomes statistically insignificant in the longer run pointing out that the market adjusts the valuation of technology IPOs over time. Additionally, the constant term is highly positively significant in all time periods, suggesting that there is a statistically significant baseline level of underpricing. This aligns with previous IPO literature which argues that underpricing is a systematic feature of IPOs (Rock, 1986; Ljungqvist, 2007).

8.2 The Influence of ESG Score and Its Components on Underpricing

The second regression model investigates whether firms with higher ESG scores experience less underpricing than firms with lower ESG scores. Thus, all companies included in the regression have an ESG score from the year of issuing, in order to provide the most accurate picture of the information available to investors at the time of the IPO. Overall, the regression results illustrated in table 8 provide no support for hypothesis two. Although the total ESG score has a positive and statistically significant relationship with the underpricing on the first day of trading, the effect quickly reduces and becomes statistically insignificant in the long run. Since the results do not show a statistically significant negative association between ESG scores and underpricing of IPOs, the null hypothesis is retained, and the alternative hypothesis is rejected. The findings are aligned with Halbritter and Dorfleitner (2015), who find that the size of ESG rating has no effect on

financial returns. Furthermore, as the results illustrate, the relationship remains positive throughout the period and thus contradicts the assumed negative relationship in the hypothesis. These findings suggest that while ESG data may have little short-term impact, it does not appear to reduce underpricing in an economically meaningful way.

Table 8. The regression results with ESG Scores.

Variable	Underpricing 1D	Underpricing 1W	Underpricing 1M	Underpricing 3M	Underpricing 6M	Underpricing 1Y
ESG Score	0,026**	0,022	0,014	0,024	0,020	0,037
	(1,994)	(1,322)	(1,038)	(1,056)	(0,849)	(1,055)
Environment Score	-0,003	-0,004	-0,001	0,001	0,004	0,001
	(-0,859)	(-0,782)	(-0,256)	(0,165)	(0,554)	(0,057)
Social Score	-0,010*	-0,011	-0,005	-0,012	-0,012	-0,017
	(-1,907)	(-1,565)	(-0,849)	(-1,297)	(-1,287)	(-1,175)
Governance Score	-0,010**	-0,009	-0,005	-0,011	-0,011	-0,018
	(-2,095)	(-1,390)	(-1,026)	(-1,297)	(-1,251)	(-1,389)
Hot Market	0,265***	0,318***	0,372***	0,608***	0,558***	0,161
	(4,629)	(4,396)	(6,135)	(6,150)	(5,529)	(1,062)
Cold Market	0,094	0,157	0,028	0,047	-0,060	-0,194
	(1,140)	(1,509)	(0,323)	(0,333)	(-0,410)	(-0,885)
Company Size	-0,036**	-0,038**	-0,023	-0,093***	-0,093***	-0,132***
	(-2,547)	(-2,113)	(-1,553)	(-3,800)	(-3,697)	(-3,499)
Company Age	0,039	0,039	-0,005	0,030	-0,012	0,018
	(1,370)	(1,096)	(-0,167)	(0,613)	(-0,239)	(0,239)
Year 2021	-0,240***	-0,313***	-0,361***	-0,715***	-0,952***	-1,192***
	(-3,215)	(-3,326)	(-4,583)	(-5,562)	(-7,252)	(-6,035)
Industry Technology	-0,037	0,023	0,088	0,051	0,102	0,274
	(-0,549)	(0,276)	(1,240)	(0,437)	(0,860)	(1,534)
Constant	0,335***	0,424***	0,322***	0,872***	1,008***	1,314***
	(2,980)	(2,993)	(2,714)	(4,503)	(5,092)	(4,413)
Observations	301	301	301	301	301	301
F-statistic	3,684	3,178	4,809	6,498	7,921	6,266
Prob(F-statistic)	0,000	0,001	0,000	0,000	0,000	0,000
R-squared	0,113	0,099	0,142	0,183	0,215	0,178
Adjusted R-squared	0,082	0,068	0,113	0,155	0,187	0,149
S.E. of regression	0,397	0,501	0,42	0,685	0,7	1,053

*****, **, and * show statistical significance at the 1 %, 5 %, and 10 % levels, respectively. The numbers in parentheses represent the t-statistics.**

The results suggest that ESG presence matters more than the actual score. However, among the individual ESG components the Governance score stands out. Governance scores are negatively and significantly associated with underpricing on the first day of trading, indicating that firms with stronger governance scores may benefit from more accurate IPO pricing. Baker et al. (2021) report similar findings of negative relation between the Governance scores and underpricing. However, Environmental and Social

scores have no statistically significant effect on underpricing at any time horizon. This suggests that investors may view governance quality as a more concrete indicator of firm stability or credibility at the time of IPO pricing, while environmental and social factors are likely to be seen as longer-term considerations that are not taken into account immediately at the time of IPO.

The analysis demonstrates that IPOs in hot markets are significantly underpriced at all periods from 1D to 6M. The result is in line with previous literature according to which IPOs launched during hot periods experience stronger underpricing (Ibbotson & Jaffe, 1975; Ljungqvist & Wilhelm, 2003). On the other hand, the cold market variable is insignificant across all periods. Moreover, firm size has a strong and consistently negative association with underpricing strengthening in the longer term. Furthermore, the 2021 dummy remains highly significant and negative all year, suggesting that IPOs launched during this record year were systematically less underpriced, as found in the first regression also. Furthermore, the Industry Technology variable is statistically insignificant in all underpricing periods, which differs from the findings in table 7. The reduction in the significance in the second regression is likely to be due to the sample becoming more homogeneous, especially with more mature or established technology firms. Although the coefficient is positive in most periods the lack of significance indicates that being a technology firm alone does not explain the variation in underpricing.

All in all, the regression results show that investors may respond to ESG signals in very short-term but not in a way that meaningfully changes IPO pricing outcomes. This statement is supported by small and mostly insignificant ESG coefficients, which together suggest that their economic impact on underpricing is negligible. While governance factors and firm characteristics such as size and market timing seem more important, possessing a high or a low ESG score alone does not appear to consistently or significantly influence IPO pricing. Additionally, while ESG considerations may influence investor perceptions, they are not strong enough to determine the reason for underpricing of IPOs in this sample.

8.3 Market Conditions as a Moderator of ESG Effects

Interaction terms are added to the model in the third regression to examine whether hot and cold IPO markets shape the impact of ESG on underpricing. Overall, the results provide limited support for this moderating effect as can be seen from table 9. The interaction terms, where ESG scores are multiplied with hot and cold markets dummies, are statistically insignificant in almost all time periods, except for the marginal significance of the hot market interaction at the 1D level. Therefore, the results suggest that the relationship between ESG scores and underpricing of IPOs are not significantly affected by market temperature, meaning the role of ESG does not fluctuate based on IPO timing. This lack of moderating effect may mean that investors' interpretations of ESG signals are relatively stable across different IPO climates. Alternatively, in hot markets, investors may be more influenced by short-term growth stories than long-term ESG considerations. This may reduce the value of the ESG score signal in these periods. All in all, considering the results, the null hypothesis cannot be rejected.

These findings provide interesting reflections on the theoretical framework presented earlier in this thesis. Signaling theory suggests ESG ratings act as a strong positive signal reducing uncertainty around IPOs (Schmunkamp, 2025). However, the limited moderating effect of market conditions and the variable importance of ESG ratings suggest that ESG disclosures may not yet be a sufficiently strong or widely trusted signal for IPOs. The results also provide limited support for the asymmetric information theory that ESG announcements are particularly relevant in colder or riskier market conditions (Duong et al., 2024). Instead, the stable but modest impact of ESG across market conditions suggests that ESG acts as a general indicator of quality rather than as a information mechanism in IPOs.

Table 9. The regression results interaction terms included.

Variable	Underpricing 1D	Underpricing 1W	Underpricing 1M	Underpricing 3M	Underpricing 6M	Underpricing 1Y
ESG Score	0,022*	0,021	0,009	0,025	0,022	0,039
	(1,656)	(1,226)	(0,630)	(1,042)	(0,907)	(1,085)
Environment Score	-0,003	-0,004	0,000	0,001	0,003	0,000
	(-0,704)	(-0,739)	(-0,065)	(0,147)	(0,502)	(0,019)
Social Score	-0,010*	-0,011	-0,004	-0,012	-0,013	-0,017
	(-1,808)	(-1,542)	(-0,716)	(-1,301)	(-1,309)	(-1,191)
Governance Score	-0,010*	-0,008	-0,005	-0,011	-0,011	-0,019
	(-1,933)	(-1,298)	(-0,882)	(-1,324)	(-1,281)	(-1,414)
Hot Market	0,042	0,156	0,171	0,693***	0,652**	0,290
	(0,296)	(0,868)	(1,127)	(2,794)	(2,570)	(0,759)
Cold Market	0,335	0,637**	-0,091	-0,205	-0,066	-0,282
	(1,593)	(2,399)	(-0,408)	(-0,561)	(-0,177)	(-0,500)
ESG Score*Hot Market	0,009*	0,007	0,009	-0,004	-0,004	-0,005
	(1,694)	(0,965)	(1,444)	(-0,369)	(-0,402)	(-0,366)
ESG Score*Cold Market	-0,010	-0,021*	0,005	0,011	0,000	0,004
	(-1,233)	(-1,954)	(0,586)	(0,747)	(0,017)	(0,168)
Company Size	-0,035**	-0,035**	-0,024	-0,095***	-0,093***	-0,132***
	(-2,468)	(-1,969)	(-1,608)	(-3,837)	(-3,670)	(-3,486)
Company Age	0,037	0,034	-0,002	0,032	-0,012	0,018
	(1,316)	(0,960)	(-0,076)	(0,661)	(-0,247)	(0,241)
Year 2021	-0,261***	-0,332***	-0,376***	-0,705***	-0,944***	-1,180***
	(-3,491)	(-3,523)	(-4,727)	(-5,417)	(-7,100)	(-5,898)
Industry Technology	-0,033	0,022	0,097	0,052	0,099	0,271
	(-0,490)	(0,258)	(1,356)	(0,441)	(0,828)	(1,506)
Constant	0,377***	0,422***	0,397***	0,874***	0,980***	1,285***
	(3,085)	(2,735)	(3,055)	(4,114)	(4,510)	(3,929)
Observations	301	301	301	301	301	301
F-statistic	3,589	3,188	4,188	5,467	6,574	5,207
Prob(F-statistic)	0,000	0,000	0,000	0,000	0,000	0,000
R-squared	0,13	0,117	0,149	0,186	0,215	0,178
Adjusted R-squared	0,094	0,08	0,113	0,152	0,182	0,144
S.E. of regression	0,395	0,498	0,42	0,686	0,702	1,056

*****, **, and * show statistical significance at the 1 %, 5 %, and 10 % levels, respectively. The numbers in parentheses represent the t-statistics.**

Looking at the ESG variables themselves, ESG score remains positive in all models as in earlier models, although its coefficients are insignificant except at 1D. This contradicts the assumption that better ESG performance reduces underpricing and further suggests that investors may not price ESG factors as a sign of lower risk or stronger fundamentals in IPOs. This may also reflect a timing mismatch with ESG activities playing a greater role after the IPO. At the IPO stage, investors may not have the necessary ESG disclosure or confidence in the metrics presented which can further limit the practical use of ESG scores in initial valuations. Moreover, among the individual ESG components, Social score and Governance score are negative in all periods. In addition, both of them are significant at 10% level in 1D, when Environment score is consistently close to zero and

statistically insignificant, suggesting that IPO investors have a limited perception or interpretation of environmental performance.

Firm-level characteristics continue to have a significant impact on underpricing underlining their significance in IPOs. Company size is consistently negative and highly significant across all time periods except 1M. In contrast, Company age is not statistically significant in any of the windows. Furthermore, the dummy variable Year 2021 is again highly significant and negative in all models. This may be due to the war in Ukraine that started in February 2022, which had a downward impact on American stock prices (Chowdhury & Khan, 2024). The results presented in the regression reflect the reduced underpricing experienced by companies listed in 2021. The effect is seen from 3M and onwards, when the coefficients are strongly negative and significant.

The results for hot and cold market dummies are mixed. While hot market conditions have a clear effect in the medium term, the effect of cold market timing lacks consistency. While the hot market dummy becomes significant in the medium term, the 2021 dummy is highly significant in all time periods. This suggests that the unusual IPO activity and investor sentiment observed in 2021 had a unique and persistent effect on underpricing that cannot be fully captured by quarterly hot market ratings. The significance of the 2021 dummy reflects that the year was extraordinary compared to other hot issue periods since 2010. It is also possible that the maturity of the U.S. market contributes to these patterns. In this context, investors may require more concrete and standardized ESG disclosures in order to act meaningfully on the data. The lack of congruent ESG reporting requirements in the U.S. may therefore limit the reliability and perceived value of ESG signals in the context of an IPO.

9 Conclusions and Discussion

This section reviews the main findings, practical implications as well as any limitations of the thesis. Finally, topics for possible further research are suggested.

9.1 Conclusions

This thesis aims to clarify the relationship between ESG and the underpricing of IPOs and to further explain how this effect varies depending on the market situation. In recent years, ESG factors have gained significant attention in financial literature. This growing focus is driven by a growing awareness of the impact of companies on the environment and whole society. Furthermore, there is belief that strong ESG practices can support better long-term financial performance (Amel-Zadeh & Serafeim, 2018). Companies have started to openly share information about their ESG related issues, leading to investors receiving tools they need to make smarter and more informed investment decisions.

This thesis compares firms that have an ESG rating at the time of issuing with firms that do not disclose ESG before listing and examines how this affects the underpricing of IPOs. Theory suggests that disclosing ESG prior to issuance reduces underpricing by decreasing the amount of asymmetric information. However, the evidence provided suggests the opposite. The results shown in the first model illustrate that ESG present is highly positive and significant in all periods indicating that firms with an ESG rating prior to going public tend to be more underpriced than those without. These findings support the signaling theory according to which firms signal quality before issuance to prove their quality to investors (Economidou et al., 2022; Schmunkamp, 2025). A successful signaling of a company's quality leads to rising investor confidence followed by strong financial performance immediately after the IPO, which is reflected in strong IPO underpricing.

In contrast, the actual size of the ESG score does not seem to have much impact on the pricing of IPOs. The second regression shows that the ESG scores are statistically

significant only on the first day of trading. In later periods the effect changes and is statistically insignificant. This suggests that investors may not be assessing the quality or depth of ESG activity when pricing an IPO but instead react to its presence as a signal. Moreover, the effects of individual ESG components are mixed. Social and Governance scores are slightly negatively significant with underpricing in the very short-run, while environmental scores are close to zero and remain insignificant over time, suggesting that investors interpret environmental performance in this context only slightly.

Finally, interaction terms are introduced to estimate the effect of hot and cold IPO markets. The results show no consistent evidence that market timing significantly moderates the relationship between ESG and the underpricing of IPOs. Apart from one significant hot interaction term at the 1D level, the interaction terms were insignificant across all periods. This indicates that the effect of ESG does not vary significantly between hot and cold market conditions. Overall, the results suggest that the signaling power of ESG is stable across market environments, however, only significant in very short-term. In other words, ESG can act as a signal to reduce uncertainty or to indicate firm quality. This effect does not depend on whether the IPO market is hot or cold. Thus, the results support the idea that ESG acts as a general signal but provide little support for asymmetric information models that suggest that ESG is more relevant in risky or colder market conditions.

The results of this thesis offer several implications for companies considering going public. Disclosing ESG prior to listing can be a strategic tool to attract investor interest, especially in the short-term. Increased underpricing due to published ESG scores reflect amplified investor demand rather than mispricing caused by asymmetric information. Companies may benefit from this increased attention, as it may lead to successful IPOs. However, as the actual score does not appear to have a consistently significant impact on pricing, companies may prioritize obtaining a rating over improving ESG performance for the sole purpose of valuing the IPO. Based on the results, investors and analysts should remain cautious when assuming that higher ESG scores reflect lower risk or better

financial prospects in an IPO. Together, these findings help both issuers and investors to make informed decisions about ESG disclosure strategies in capital markets.

9.2 Limitations and Suggestions for Further Research

While this thesis provides valuable insights into the relationship between ESG scores and underpricing of IPOs, as in all studies limitations need to be considered. First, the availability and consistency of ESG data is a limitation in the research of ESG and IPOs. The analysis includes only those companies that had an ESG rating available at the time of the IPO. Moreover, since the popularity of ESG has risen only recently, very few listed companies have official ESG data available from the issuance period. In addition, ESG ratings are provided by different providers that might value firms differently, which can pose further risks (Chatterji et al., 2015). ESG rating agencies often use different types of data sources leading to different providers giving different scores. This provider dependency can affect the comparability of the paper and may not give an accurate picture of what investors really knew or trusted at the time of the IPO.

The regression models used identify links between ESG factors and underpricing. However, they cannot fully determine whether ESG scores cause the differences in underpricing. There may be unobservable variables, such as company reputation, underwriter quality, revenue or investor opinion, that simultaneously affect both ESG ratings and IPO performance (Schmunkamp, 2025). The time dimension of ESG ratings is also a challenge. Although this thesis uses ESG scores from the year of the IPO, the ratings are often retrospective. As a result, ESG scores may not fully reflect what investors actually knew when pricing the IPO.

Besides, ESG as a measurement is still in early stages. The reliability and interpretability of ESG scores, especially the environmental component, are still evolving. For instance, compared to accounting standards, there is yet no global framework for ESG reporting (Cicchiello et al., 2022). Furthermore, in contrast to the EU, ESG reporting was not mandatory in the U.S. during the period covered by this study. Thus, the environmental

component is particularly difficult to measure due to the lack of consistent and verifiable environmental data. Finally, since this study is based exclusively on U.S. IPOs, it must take into account that it limits the generalizability of the results to other markets where, for example, investor behavior, regulatory environment and ESG expectations are different.

This thesis acknowledges that there is still limited research on ESG, moreover, research on the impact of ESG on IPOs. Future research should consider the limitations of this study. Also, as ESG reporting standards and measurement methodologies continue to evolve, studies should focus on how improvements in the quality of ESG data affects its relationship with the underpricing of IPOs. As companies have an obligation to disclose ESG as in the future, investors will have better access to more reliable and comparable ESG data. Therefore, future studies could investigate whether the relationship between ESG scores and underpricing of IPOs becomes stronger, more significant or reverses direction in these improved circumstances. This would help to clarify whether the weak or inconsistent ESG effects observed in current studies are due to real investor indifference or simply to imperfect measurement.

References

Ademi B., & Klungseth N. (2022). Does it pay to deliver superior ESG performance? Evidence from US S&P 500 companies. *J Glob Respon*, 13(4), 421–449. https://doi.org/10.1108/JGR-01-2022-0006

Aggarwal, R. (2000). Stabilization Activities by Underwriters after Initial Public Offerings. *The Journal of Finance.* 55(3), 1075–1103. https://doi.org/10.1111/0022-1082.00241

Aghamolla, C., & Thakor, R. T. (2021). IPO peer effects. *Journal of Financial Economics.* 144(1), 206-226. https://doi.org/10.1016/j.jfineco.2021.05.055

Akerlof, G. A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics,* 84(3), 488. https://doi.org/10.2307/1879431

Allen, F., & Faulhaber, G. R. (1989). Signalling by underpricing in the IPO market. *Journal of Financial Economics,* 23(2), 303–323. https://doi.org/10.1016/0304405x(89)90060-3

Álvarez, S., & González, V. M. (2005). Signalling and the Long-run Performance of Spanish Initial Public Offerings (IPOs). *Journal of Business Finance & Accounting*, 32(1-2), 325–350. https://doi.org/10.1111/j.0306-686x.2005.00596.x

Amel-Zadeh, A., & Serafeim, G. (2018). Why and How Investors Use ESG Information: Evidence from a Global Survey. *Financial Analysts Journal*, 1–17. https://doi.org/10.2469/faj.v74.n3.2

Amihud, Y., Hauser, S., & Kirsh, A. (2003). Allocations, adverse selection, and cascades in IPOs: Evidence from the Tel Aviv Stock Exchange. *Journal of Financial Economics*, 68(1), 137–158. https://doi.org/10.1016/s0304-405x(02)00251-9

Asimakopoulos, P., Asimakopoulos, S., & Xi, L. (2023). The role of environmental, social, and governance rating on corporate debt structure. *Journal of Corporate Finance,* 83, 102488, https://doi.org/10.1016/j.jcorpfin.2023.102488

Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. (1985). An Empirical Examination of the Relationship Between Corporate Social Responsibility and Profitability. *Academy of Management Journal*, 28(2), 446–463. https://doi.org/10.2307/256210

Aydoğmuş, M., Gülay, G., & Ergun, K. (2022). Impact of ESG performance on firm value and profitability. *Borsa Istanbul Review,* 22(2), 119-127. https://doi.org/10.1016/j.bir.2022.11.006.

Baker, M., & Wurgler, J. (2002). Market Timing and Capital Structure. *The Journal of Finance*, 57(1), 1–32. https://doi.org/10.1111/1540-6261.00414

Baker, E. D., Boulton, T, J., Braga-Alves, M, V., & Morey, M, R. (2021). ESG government risk and international IPO underpricing. *Journal of Corporate Finance*, 67, 101913. https://doi.org/10.1016/j.jcorpfin.2021.101913

Barber, B., & Odean, T. (2008). All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors. *Review of Financial Studies,* 21, 785-818. https://doi.org/10.2139/ssrn.460660

Baron, D. P. (1982). A Model of the Demand for Investment Banking Advising and Distribution Services for New Issues. *The Journal of Finance,* 37(4), 955–976. https://doi.org/10.1111/j.1540-6261.1982.tb03591.x

Beatty, R. P., & Ritter, J. R. (1986). Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics,* 15(1-2), 213-232. https://doi.org/10.1016/0304-405x(86)90055-3

Benveniste, L. M., Busaba, W. Y., & Wilhelm, W. J. (1996). Price stabilization as a bonding mechanism in new equity issues. *Journal of Financial Economics,* 42(2), 223–255. https://doi.org/10.1016/0304-405x(96)00880-x

Berry, T., & Howe, K. (1994). Public Information Arrival. *Journal of Finance*, 49, 1331-46. https://doi.org/10.1111/j.1540-6261.1994.tb02456.x

Bikhchandani, S., & Sharma, S. (2000). Herd Behavior in Financial Markets: A Review. *IMF Working Paper,* No 2000/048. https://doi.org/10.5089/9781451846737.001

Boeh, K., & Dunbar, C. (2014). IPO waves and the issuance process. *Journal of Corporate Finance,* 25, 455–473. https://doi.org/10.1016/j.jcorpfin.2014.02.001

Borgers, A., Derwall, J., Koedijk, K., & Jenke, H. (2013). Stakeholder relations and stock returns: On errors in investors' expectations and learning. *Journal of Empirical Finance*, 22, 159–175. https://doi.org/10.1016/j.jempfin.2013.04.003

Certo, S. T., Covin, J. G., Daily, C. M., & Dalton, D. R. (2001). Wealth and the effects of founder management among IPO-stage new ventures. *Strategic Management Journal,* 22(6-7), 641–658. https://doi.org/10.1002/smj.182

Chambers, D., & Dimson, E. (2009). IPO underpricing over the very long run. *The Journal of Finance,* 64(3), 1407-1443. https://doi.org/10.1111/j.1540-6261.2009.01468.x

Chan, K., Wang, J., & Wei, K. C. J. (2004). Underpricing and long-term performance of IPOs in China. *Journal of Corporate Finance,* 10(3), 0–430. https://doi.org/10.1016/s0929-1199(03)00023-3

Chatterji, A. K., Durand, R., Levine, D. I., & Touboul, S. (2015). Do ratings of firms converge? Implications for managers, investors and strategy researchers. *Strategic Management Journal,* 37(8), 1597–1614. https://doi.org/10.1002/smj.2407

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

Chod, J., & Lyandres, E. (2011). Strategic IPOs and product market competition. *Journal of Financial Economics,* 100(1), 45-67. https://doi.org/10.1016/j.jfineco.2010.10.010

Chowdhury, E.K., & Khan, I.I. (2024). Reactions of Global Stock Markets to the Russia–Ukraine War: An Empirical Evidence. *Asia-Pac Finance Markets,* 31, 755–778. https://doi.org/10.1007/s10690-023-09429-4

Cornanic, A., & Novak, J. (2015). Signaling by underpricing the initial public offerings of primary listings in an emerging market. *Finance a Uver,* 65(4), 307-335.

Cornelli, F., & Goldreich, D. (2001). Bookbuilding: How Informative is the Order Book. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.243142

Daily, C. M., Certo, S. T., Dalton, D. R., & Roengpitya, R. (2003). IPO Underpricing: A Meta Analysis and Research Synthesis. *Entrepreneurship Theory and Practice*, 27(3), 271–295. https://doi-org.proxy.uwasa.fi/10.1111/1540-8520.t01-1-00004

Derrien, F., & Womack, K. (2003). Auctions vs. Bookbuilding and the Control of Underpricing in Hot IPO Markets. *Review of Financial Studies,* 16(1), 31-61. https://doi.org/10.1093/rfs/16.1.31

Derwall, J., & Verwijmeren, P. (2007). Corporate governance and the cost of equity capital: Evidence from gmi's governance rating. *European Centre for Corporate Engagement Research Note*, 6(1), 1-11.

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

Dittmar, A., & Dittmar, R. (2008). The timing of financing decisions: An examination of the correlation in financing waves. *Journal of Financial Economics,* 90(1), 59–83. https://doi.org/10.1016/j.jfineco.2007.11.007

Dolvin, S. D. (2013). IPO Underpricing: The Owners' Perspective. *Journal of Economics and Finance Education,* 11(2), 63-69.

Drogovoz, P., Druchok, S., & Fedorova, E. (2021). Impact of news sentiment and topics on IPO underpricing: US evidence. *International Journal of Accounting & Information Management,* 30(1), 73-94. https://doi.org/10.1108/IJAIM-06-2021-0117

Duong, L., Luong, H., Nguyen, L., & Wang, Z. (2024). Mandatory ESG Disclosure and IPO Underpricing Worldwide. https://doi.org/10.2139/ssrn.4986121

Economidou, C., Gounopoulos, D., Konstantios, D., & Tsiritakis, E. (2022). Is sustainability rating material to the market? *Financial management,* 52(1), 127-179. https://doi.org/10.1111/fima.12406

Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance,* 25(2), 383. https://doi.org/10.2307/2325486

Fama, E, F., & MacBeth, J. D. (1973). Risk, Return, and Equilibrium: Empirical Tests. *Journal of Political Economy,* 81(3), 607–636. https://doi.org/10.1086/260061

Ferri, S., Tron, A., Colantoni, F., & Savio, R. (2023). Sustainability Disclosure and IPO Performance: Exploring the Impact of ESG Reporting. *Sustainability*, 15(6), 5144. https://doi.org/10.3390/su15065144

Freeman, R. E. (1984). Strategic management: A stakeholder approach. *Boston, Pitman Publishing Inc.*

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment,* 5(4), 210–233. https://doi.org/10.1080/20430795.2015.1118917

Friedman, M. (1970) The Social Responsibility of Business Is to Increase Its Profits. *New York Times Magazine,* 122-126.

Fu, M., Yu, D., & Zhou, D. (2023). Secret Recipe of IPO survival: ESG disclosure and performance. *Financial Markets, Institutions and Instruments.* 32(1), 3-19. https://doi.org/10.1111/fmii.12169

Ghosh, C., Nag, R., & Sirmans, C. F. (2000). A Test of the Signaling Value of IPO Underpricing with REIT IPO-SEO Pairs. *The Journal of Real Estate Finance and Economics,* 20(2), 137–154. https://doi.org/10.1023/a:1007873120566

Giese, G., Lee, L-E., Melas, D., Nagy, Z., & Nishikawa, L. (2019). Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk, and Performance. *The Journal of Portfolio Management,* 45(5), 69-83 https://doi.org/10.3905/jpm.2019.45.5.069

Go, P. (2022). How ESG disclosures impact IPO valuation. *EY.* Retrieved 2025-04-11 from https://www.ey.com/en_fi/insights/ipo/how-esg-disclosures-impact-ipo-valuation

Habib, M. A., & Ljungqvist, A. P. (2001). Underpricing and Entrepreneurial Wealth Losses in IPOs: Theory and Evidence. *Review of Financial Studies,* 14(2), 433 458. https://doi.org/10.1093/rfs/14.2.433

Halbritter, G., & Dorfleitner, G. (2015). The wages of social responsibility — where are they? A critical review of ESG investing. *Review of Financial Economics,* 26(), 25–35. https://doi.org/10.1016/j.rfe.2015.03.004

Harrison, J., Freeman, R. E., & Cavalcanti Sá de Abreu, M. (2015). Stakeholder Theory As an Ethical Approach to Effective Management: applying the theory to multiple contexts. *Review of Business Management,* 17(55), 858–869. https://doi.org/10.7819/rbgn.v17i55.2647

Helwege, J., & Liang, N. (2004). Initial Public Offerings in Hot and Cold Markets. *Journal of Financial and Quantitative Analysis,* 39(03), 541. https://doi.org/10.1017/s0022109000004026

Hillman, A. J., & Keim, G. D. (2001). Shareholder value, stakeholder management, and social issues: what's the bottom line? *Strategic Management Journal,* 22(2), 125-139. https://doi.org/10.1002/1097-0266(200101)22:2<125::aid-smj150>3.0.co;2-h

Huang, D. (2021). Environmental, social and governance factors and assessing firm value: valuation, signalling and stakeholder perspectives. *Accounting & Finance,* 62. https://doi.org/10.1111/acfi.12849

Ibbotson, R. G., & Jaffe, J. F. (1975). "Hot Issue" Markets. *The Journal of Finance,* 30(4), 1027–1042. https://doi.org/10.1111/j.1540-6261.1975.tb01019.x

Ibbotson, R. G., Sindelar, J. L., & Ritter, J. R. (1994). The Market's Problems With the Pricing of Initial Public Offerings. *Journal of Applied Corporate Finance,* 7(1), 66–74. https://doi.org/10.1111/j.1745-6622.1994.tb00395.x

Ioannou, I., & Serafeim, G. (2011). The Consequences of Mandatory Corporate Sustainability Reporting. *SSRN Electronic Journal,* 7387. https://doi.org/10.2139/ssrn.1799589

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

Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica,* 47(2), 263. https://doi.org/10.2307/1914185

Kaźmierczak, M. (2022). A literature review on the difference between CSR and ESG. *Scientific Papers of Silesian University of Technology. Organization and Management Series,* 275-289. https://doi.org/10.29119/1641-3466.2022.162.16

Keloharju, M. (1993). The winner's curse, legal liability, and the long-run price performance of initial public offerings in Finland. *Journal of Financial Economics,* 34(2), 251–277. https://doi.org/10.1016/0304-405x(93)90020-c

Kempf, A., & Osthoff, P. (2007). The Effect of Socially Responsible Investing on Portfolio Performance. *European Financial Management,* 13(5), 908–922. https://doi.org/10.1111/j.1468-036x.2007.00402.x

Kim, W., & Weisbach, M. (2008). Motivations for public equity offers: An international perspective. *Journal of Financial Economics*, 87(2), 281-307. https://doi.org/10.1016/j.jfineco.2006.09.010

Koh, F., & Walter, T. (1989). A direct test of Rock's model of the pricing of unseasoned issues. *Journal of Financial Economics,* 23(2), 251-272. https://doi.org/10.1016/0304-405x(89)90058-5

Kong, X., Li, Z., & Lei, X. (2024). Research on the impact of ESG performance on carbon emissions from the perspective of green credit. *Scientific Reports,* 14, 10478. https://doi.org/10.1038/s41598-024-61353-3

KPMG. (2020). The time has come. The KPMG Survey of Sustainability Reporting 2020. Retrieved 2025-04-11 from https://assets.kpmg.com/content/dam/kpmg/be/pdf/2020/12/The_Time_Has_Come_KPMG_Survey_of_Sustainability_Reporting_2020.pdf

Lerner, J., Shane, H., & Tsai, A. (2003). Do equity financing cycles matter? Evidence from biotechnology alliances. *Journal of Financial Economics*, 67(3), 411–446. https://doi.org/10.1016/s0304-405x(02)00256-8

Ljungqvist, A. (2003). Conflicts of Interest and Efficient Contracting in Ipos. NYU, *Ctr for Law and Business Research Paper,* 03-03. https://doi.org/10.2139/ssrn.333820

Ljungqvist, A. (2007). IPO Underpricing. *Handbook of Empirical Corporate Finance,* 1, 375–422. https://doi.org/10.1016/b978-0-444-53265-7.50021-4

Ljungqvist, A., & Wilhelm, W. J. (2003). IPO Pricing in the Dot-com Bubble. *The Journal of Finance,* 58(2), 723–752. https://doi.org/10.1111/1540-6261.00543

Loughran, T., & Ritter, J. R. (2002). Why Has IPO Underpricing Changed Over Time? *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.331780

Lowry, M., & Schwert, G. W. (2002). IPO Market Cycles: Bubbles or Sequential Learning? *The Journal of Finance,* 57(3), 1171–1200. https://doi.org/10.1111/1540-6261.00458

Lowry, M., & Shu, S. (2002). Litigation risk and IPO underpricing. *Journal of Financial Economics,* 65(3), 309–335. https://doi.org/10.1016/s0304

LSEG. (2025). LSEG ESG Scores. Retrieved 2025-04-18 from https://www.lseg.com/en/data-analytics/sustainable-finance/esg-scores

Mackintosh, P. (2022). A Record Year for IPOs in 2021. *Nasdaq.* Retrieved 2025-03-26 from https://www.nasdaq.com/articles/a-record-year-for-ipos-in-2021

Mauer, D. C., & Senbet, L. W. (1992). The Effect of the Secondary Market on the Pricing of Initial Public Offerings: Theory and Evidence. *The Journal of Financial and Quantitative Analysis,* 27(1), 55. https://doi.org/10.2307/2331298

Muscarella, C. J., & Vetsuypens, M. R. (1989). A simple test of Baron's model of IPO underpricing. *Journal of Financial Economics,* 24(1), 125 135. https://doi.org/10.1016/0304-405x(89)90074-3

Naeem, R., Ullah, H., Shahid, D., & Kakakhel, S. (2022). The Impact of ESG Practices on Firm Performance: Evidence From Emerging Countries. *Indian Journal of Economics and Business,* 20(1), 731-750.

Nagy, Z., Kassam, A., & Lee, L-E. (2016). Can ESG Add Alpha? An Analysis of ESG Tilt and Momentum Strategies. *The Journal of Investing,* 25(2), 113–124. https://doi.org/10.3905/joi.2016.25.2.113

Nasdaq. (2022). As Companies Stay Private Longer, Advisors Need Access to Private Markets. Retrieved 2025-03-29 from https://www.nasdaq.com/articles/as-companies-stay-private-longer-advisors-need-access-to-private-markets

Narula, R., Rao, P., Kumar, S., & Matta, R. (2024). ESG scores and firm performance - evidence from emerging market. *International Review of Economics & Finance,* 89, 1170-1184, https://doi.org/10.1016/j.iref.2023.08.024

Pagano, M., Panetta, F., & Zingales, L. (1996). The stock market as a source of capital: Some lessons from initial public offerings in Italy. *European Economic Review,* 40(3-5), 1057–1069. https://doi.org/10.1016/0014-2921(95)00115-8

Pagano, M., Panetta, F. & Zingales, L. (1998). Why Do Companies Go Public? An Empirical Analysis. *Journal of Finance,* 53(1), 27-64. https://doi.org/10.1111/0022 1082.25448

Pastor, L., & Veronesi, P. (2005). Rational IPO Waves. *SSRN Electronic Journal,* https://doi.org/10.2139/ssrn.1957448

Pei-yi Yu, E., Van Luu, B., & Chen, C. H. (2020). Greenwashing in environmental, social and governance disclosures. *Research in International Business and Finance,* 52, 101192. https://doi.org/10.1016/j.ribaf.2020.101192

Phillips, R., Freeman, R. E., & Wicks, A. C. (2003). What Stakeholder Theory is Not. *Business Ethics Quarterly,* 13(4), 479–502. https://doi.org/10.5840/beq200313434

Plotnicki, M., & Szyszka, A. (2014). IPO market timing. The evidence of the disposition effect among corporate managers. *Global Finance Journal,* 25(1), 48–55. https://doi.org/10.1016/j.gfj.2014.03.005

Post, J. E., Preston, L. E., & Sachs, S. 2002. Redefining the corporation: Stakeholder management and organizational wealth. *Stanford, CA: Stanford University Press.*

Rajan, R. & Servaes, H. (2002). The Effect of Market Conditions on Initial Public Offerings. *Working Paper, University of Chicago.*

Ransley, R.D. (1984). A research project into the operation and development of the unlisted securities market 1980-1984, *Unpublished, (London Business School, London).*

Reber, B., & Vencappa, D. (2016). Deliberate premarket underpricing and aftermarket mispricing: New insights on IPO pricing. *International Review of Financial Analysis,* 44, 18-33. https://doi.org/10.1016/j.irfa.2015.11.007

Reber, B., Gold, A., & Gold, S. (2021). ESG Disclosure and Idiosyncratic Risk in Initial Public Offerings. *Journal of Business Ethics* (179), https://doi.org/10.1007/S10551-021-04847-8

Revelli, C., & Viviani, J.-L. (2014). Financial performance of socially responsible investing (SRI): what have we learned? A meta-analysis. *Business Ethics: A European Review,* 24(2), 158–185. https://doi.org/10.1111/beer.12076

Ritter, J. R. (1984). The "Hot Issue" Market of 1980. *The Journal of Business,* 57(2), 215-240. https://doi.org/10.1086/296260

Ritter, J. R. (1987). The costs of going public. *Journal of Financial Economics,* 19(2), 269–281. https://doi.org/10.1016/0304-405x(87)90005-5

Ritter, J. R. (1998). Initial Public Offerings. *Warren Gorham and Lamont Handbook of Modern Finance,* 2, 5-30.

Ritter, J. R., & Welch, I. (2002). A Review of IPO Activity, Pricing, and Allocations. *The Journal of Finance,* 57(4), 1795–1828. https://doi.org/10.1111/1540 6261.00478

Rock, K. (1986). Why new issues are underpriced. *Journal of Financial Economics*, 15(1-2), 187–212. https://doi.org/10.1016/0304-405x(86)90054-1

Rowley, T., & Berman, S. (2000). A Brand New Brand of Corporate Social Performance. *Business & Society,* 39(4), 397-418. https://doi.org/10.1177/000765030003900404

Ruud, J. S. (1993). Underwriter price support and the IPO underpricing puzzle. *Journal of Financial Economics,* 34(2), 135–151. https://doi.org/10.1016/0304 405x(93)90015-4

Rydqvist, K., & Högholm, K. (1995). Going public in the 1980s: Evidence from Sweden. *European Financial Management,* 1(3), 287-315. https://doi.org/10.1111/j.1468-036x.1995.tb00021.x

Röell, A. (1996). The decision to go public: An overview. *European Economic Review,* 40(3-5), 1071–1081. https://doi.org/10.1016/0014-2921(95)00114-x

Schmunkamp, P. (2025). How Does ESG Ratings Influence IPO's Underpricing? Evidence from the US Market. *Journal of Economics & Management Research.* 1-8. https://doi.org/10.47363/JESMR/2025(6)265

Siev, S., & Qadan, M. (2022). Call Me When You Grow Up: Firms' Age, Size, and IPO Performance across Sectors. *Journal of Risk and Financial Management*, 15(12), 586. https://doi.org/10.3390/jrfm15120586

Slovin, M. B., Sushka, M., E., & Bendeck, Y. M. (1994). Seasoned common stock issuance following an IPO. *Journal of Banking and Finance,* 18(1), 0–226. https://doi.org/10.1016/0378-4266(94)00087-5

Stock Analysis. (2025). Retrieved 2025-03-19 from https://stockanalysis.com/ipos/statistics/

Sundaram, A. K., & Inkpen, A. C. (2004). The Corporate Objective Revisited. *Organization Science,* 15(3), 350–363. https://doi.org/10.1287/orsc.1040.0068

Tetlock, P, C. (2010). Does Public Financial News Resolve Asymmetric Information? *Review of Financial Studies,* 23(9), 3520–3557. https://doi.org/10.1093/rfs/hhq052

Tinic, S. M. (1988). Anatomy of Initial Public Offerings of Common Stock. The Journal of Finance, 43(4), 789–822. https://doi.org/10.1111/j.15406261.1988.tb02606.x

Tsang, A., Frost, T., & Cao, H. (2023). Environmental, Social, and Governance (ESG) disclosure: A literature review, *The British Accounting Review,* 55(1), 101149, https://doi.org/10.1016/j.bar.2022.101149

UNGC. (2004). Who Cares Wins. UN Global Compact. Retrieved 2024-12-02 from https://www.unepfi.org/fileadmin/events/2004/stocks/who_cares_wins_global_compact_2004.pdf

UN Global Compact-Accenture. (2010). A new era of sustainability. Retrieved 2025-02-24 from https://d306pr3pise04h.cloudfront.net/docs/news_events%2F8.1%2FUNGC_Accenture_CEO_Study_2010.pdf

University of Vaasa. (2018). *Datastream.* Retrieved 2025-03-30 from https://lipas.uwasa.fi/~jaty/thomson/datastream.html

Utamaningsih, A., Tandelilin, A., Husnan, S. & Sartono, R. A. (2013). Asymmetric information in the IPO underwriting process on the Indonesia Stock Exchange: pricing, initial allocation, underpricing, and price stabilization. *Journal of Indonesian Economy and Business,* 28(3), 311-321. https://doi.org/10.22146/jieb.6220

Wang, Y., & Xu, M. (2023). Can ESG activities stabilise IPO prices? Evidence from the Hong Kong stock market. *European Financial Management*, 30(3), 1460-1509, https://doi.org/10.1111/eufm.12452

Welch, I. (1989). Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings. *The Journal of Finance,* 44(2), 421-449. https://doi.org/10.1111/j.1540-6261.1989.tb05064.x

Welch, I. (1992). Sequential Sales, Learning, and Cascades. *The Journal of Finance,* 47(2), 695–732. https://doi.org/10.1111/j.1540-6261.1992.tb04406.x

Whelan, T., Atz, U., Van Holt, T., & Clark, C. (2021). ESG and Financial Performance: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015-2020. *NYU Stern Center for Sustainable Business and Rockefeller Asset Management.*

Yu, Y. (2024). The Impact of ESG on Corporate Financial Performance. *Environment, Social and Governance.* 1, 20-24. https://doi.org/10.70267/5cdwpz81.

Yung, C., Çolak, G., & Wang, W. (2008). Cycles in the IPO market. *Journal of Financial Economics.* 89(1), 192-208. https://doi.org/10.1016/j.jfineco.2007.06.007

Zhang, D. (2004). Why Do IPO Underwriters Allocate Extra Shares when They Expect to Buy Them Back? *Journal of Financial and Quantitative Analysis*, 39(3), 571–594. https://doi.org/10.1017/S0022109000004038

Zhang, D. (2022). Are firms motivated to greenwash by financial constraints? Evidence from global firms' data. *Journal of International Financial Management & Accounting*, 33, 459–479. https://doi.org/10.1111/jifm.12153

Zingales, L. (1995). Insider Ownership and the Decision to Go Public. *The Review of Economic Studies,* 62(3), 425. https://doi.org/10.2307/2298036