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The impact of ESG disclosure in IPO prospectuses on underpricing

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The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

Abstract

This paper studies the information disclosure of ESG in prospectuses and the underpricing phenomenon during Initial Public Offerings. The dataset consists of approximately 1,200 observations between 2014 and 2020 on the Nasdaq and NYSE. Furthermore, information disclosure is measured by text analysis with absolute and relative word count of key words found in prospectuses. It finds significant positive effects between ESG disclosure and firm age as well as ESG disclosure and underwriter ranking. Furthermore, the analysis provides a positive significant relation with underpricing and underwriter rank as well as underpricing and firm age, for information related to social disclosure. The study extends existing literature on information disclosure of ESG matters in combination with underpricing.

Keywords:

ESG disclosure; IPOs; prospectuses; textual analysis; information asymmetry; underpricing

JEL Classification:

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1. Introduction

Nowadays, information of public traded companies is far more transparent than a few decades ago. With support of continuing digitalization many companies present company information on their websites and all investors can research this information closely. In addition, the public more and more has an opinion on environmental, social and governance matters of companies. Milieudefensie's legal actions against Royal Dutch Shell's sustainability strategy in early 2021 is an accurate example in this respect. Companies respond to these demands with special sustainability reports, ESG reports or extra ESG sections in their annual reports. In addition to public traded companies, companies that would like to go public need to comply with various rules before they can be listed on a stock exchange. One of these requirements is to file a prospectus. The prospectus is a document with all company related information to inform potential investors, that are interested in the company's stock. Over the years, many studies did research on information disclosure to investors via prospectuses and annual reports. Diamond and Verrecchia (1991) and Healy & Palepu (1993) offer several explanations on financial and non-financial information disclosure and on voluntary and non-voluntary disclosure. Ample factors influence these dynamics. An important theory associated with information disclosure in capital markets is the information asymmetry theory for the underpricing phenomenon (Baron, 1982; Ritter, 1984 and Rock, 1986). Besides information asymmetry, institutional, behavioral and ownership & control explanations are leading theories in underpricing. Hence, there are many related theories on information disclosure and underpricing.

This study focuses on characteristics during IPOs to explain levels of ESG disclosure and underpricing. Many researchers present theories on underpricing, information disclosure and ESG disclosure. One of the most important theory about underpricing is related to information asymmetry (Rock,1986). This theory is based on the following intuition. Information is important to base decisions on. More information leads to more clarity and thus less uncertainty. In financial economics investors expect to be compensated for unclarity. Underpricing is a method to compensate investors for an asymmetry in information. Other factors such as expert quality, market circumstances, ownership, behavioral and legal caution & liability are also factors to consider. In addition, the link to information disclosure is being discussed. Diamond and Verrecchia (1991) among others present evidence on the link between information disclosure, company and market characteristics.

This paper attempts to validate whether transparency on ESG information in prospectuses explain IPO underpricing in US stock markets. In addition, it aims to link ESG information disclosure on firm, market and transaction characteristics. According to the prior literature, there should be a positive effect between information disclosure and various transaction, market and firm characteristics. In addition, more information disclosure should imply less information asymmetry which leads to less underpricing. The following research question is formed: Does transparency on ESG information in prospectuses explain IPO underpricing in US stock markets?

The results support existing work on information disclosure and underpricing. The data and analyses in this study present evidence that information disclosure is partially influenced by industries, underwriters, firm age and year of issuance. Secondly, the underpricing effect is examined in this study. Unfortunately, no direct relation can be observed between underpricing and information disclosure. However, firm age as well as underwriter ranking tend to have a positive relation with underpricing.

The structure of this study is as follows. First, the literature regarding underpricing is reviewed, focusing on information asymmetry as well as other relevant explanations. This is followed by the literature review on information disclosure, prospectuses and ESG. Secondly, the hypotheses are developed and the relevant methodology is described. Moreover, the data collection and descriptive statistics are explained, the results are discussed together with the conclusions, limitations and potential future research direction.

2. Literature Review

This chapter will discuss the literature this research is built on. The first section briefly discusses the underpricing theory. Secondly, information disclosure and specifically ESG disclosure will be covered.

2.1 Underpricing theory

The underpricing theory was first documented by Ibbotson (1975). He stated that new issue offerings are underpriced. Over the years, academics have further developed Ibbotson's findings with additional theories to explain underpricing. A set of theories including asymmetric information, ownership & control, institutional and behavioral theories have since been built on the foundations of Ibbotson.

2.1.1 Information asymmetry

Asymmetric information assumes that one party holds superior information to others. The inequality in information can affect the three key participants in Initial Public Offerings (IPO): the issuer, underwriters and investors. Rock (1986) developed a model in which there are two types of investors: informed and uninformed investors. Informed investors commit resources to gather information and only subscribe to 'profitable' public offerings. Uninformed investors do not incur evaluation costs to assess the value of the public offering and subscribe to every new stock issue. This information gap creates adverse selection. In the long run, this results in an unequal allocation of 'good' shares and consequently low returns for uninformed investors, the Winner's curse. Hence, issuers use the underpricing instrument to compensate uninformed investors and attract them in IPOs, as issuers are dependent on both types of investors to successfully list companies. Rock's findings are empirically supported by several papers including Carter & Manaster (1990), Meggison & Weiss (1991) and Brau & Fawcett (2006) for instance. Beatty and Welch (1996) and Loughran and Ritter (2002) present contradicting evidence for the Winner's curse model by arguing that other factors such as expert quality, market circumstances and legal caution & liability explain underpricing.

Beatty & Ritter (1986) claim that underpricing is primarily caused by the level of ex-ante uncertainty regarding the offering's value of shares issued. This implies that extra uncertainty on the offering value has a positive effect on the level of underpricing. According to Jenkinson & Ljunqvist (2001), Boulton & Zutter (2014) and Leone, Rock & Willenborg (2007) among others, uncertainties can be classified under different pillars: size, age, country, offering

characteristics, use of IPO proceeds, prospectuses disclosure and aftermarket disclosure. Botosan (1997) finds that mitigated uncertainty due to more disclosure increases capital efficiencies and lowers cost of equity. Verrecchia (2001) shows that increased disclosure on various topics lowers investor uncertainty. Engelen & Van Essen (2010) find that firm or country specific uncertainties such as increased control and legal protection have an inverse effect on the level of underpricing. Ljungqvist & Wilhelm (2003) suggest that underwriters with a high reputation in the financial world are better in assessing and have better information on market demand, which results in less underpricing on the first trading day due to less ex-ante uncertainty.

Underwriters use the book-building mechanism to seduce informed investors to reveal positive information by allocating more stocks to informed investors and by underpricing offer prices (Benveniste & Spindt, 1989 and Hanley, 1993). More information revelation explains higher underpricing. This is named as the information relevance theory. According to Ljungqvist (2007) investors and underwriters can decrease underpricing by working together more often in IPOs, the price for disclosure will be less costly. Loughran & Ritter (2002) support the findings of the theory. However, they argue that this theory only explains underpricing partially. Over the years many researchers criticized the information relevance theory that was developed in 1990s. Brau & Fawcett (2006) conducted a survey among CEOs and concluded that few CEOs support the theory as explanation of underpricing. Additionally, Degeorge, Derrien & Womack (2007) argue that the book-building process and implications provided by Benveniste & Spindt, are only applicable to the book-building situation in the 1990s due to changes in the book-building processes.

The principal agency relation is also known as the relationship between the principal and the agent by principals delegating some decision-making authority to the agent. This could lead to for instance monitoring, bonding and residual costs. Jensen & Meckling's (1976) paper is among the first studies that show a relationship between control and separation issue. Costs generated by the existence of debt and equity holders create inefficiencies that can influence corporate decisions. Furthermore, they argue it can incur agency costs when incentives between management and pre-IPO shareholders are not aligned. Baron & Holmström (1980) and Baron (1982) present an agency problem between investment banks and issuers due to information asymmetry. For instance, well-informed investment banks that are hired as underwriter could have incentives to manipulate a bookrunning process by prioritizing certain investors in allocating shares in return for side-business with these investors. These findings are supported by Loughran & Ritter (2004). Williams (1987) presents evidence that agency costs can be

reduced by aligning incentives in executive stock ownership. Muscarella & Vetsuypens (1989) and Habib & Ljungqvist (2001) criticize this theory by presenting evidence that shows significant underpricing of the self-marketed IPO transactions of investment banks. Despite the fact that there is no information asymmetry between issuer and underwriter, underpricing still exists.

Allen & Faulhaber (1989), Grinblatt & Hwang (1989) and Welch (1989) all present the signaling theory of companies in underpricing. Companies that are able to underprice during IPO transactions send a positive signal to potential investors due to the fact only high-quality firms can afford underpricing in IPOs. Consequently, it leads to a good taste in investors' mouth and offers an improved position for future seasonal offerings. On the other hand, according to many other academics including Spiess & Pettway (1997) and Gale & Stiglitz (1989) companies do not recover from underpricing after their equity offerings. Carter & Manaster (1990) suggest that investment banks can also bring a positive signal to the market. Tinic (1988) argues that prestigious investment banks as underwriter are observed by the market as more reliable and good quality. The same applies to trustworthy accounting firms (Beatty, 1989) and venture capital involvement (Megginson and Weiss, 1991). Ritter (2011) criticizes the signaling theory as there are more options to give a signal to investors such as advertising or donations. Furthermore, Ritter argues that this signal model only captures information asymmetries between investors and IPO issuers and not between other parties involved in the IPO process.

Habib & Ljungqvist (2001) argue that issuers do not randomly select underwriters and vice versa. This leads to an endogenous relation between the amount of underpricing, predetermined underpricing the issuer wants to have, and choice of underwriter. Company owners can manipulate the level of underpricing through, for instance, underwriter choice or choice of exchange listing location. The choices and trade-offs made by company owners are based on minimization of wealth losses. In addition to Habib & Ljungqvist, other researchers including Akkus, Cookson & Hortaçsu (2016) and Mantecon & Poon (2009) provide evidence on the endogenous choice of IPO issuers and picking underwriters.

2.1.2 Institutional explanations

Institutional explanations are decisions by issuers or underwriters to underprice IPOs. There are institutional explanations for underpricing. Issuers and underwriters could be exposed to disappointed investors due to poor post-IPO performance. Logue (1973) and Ibbotson (1975) were among the first researchers that attempted to explain underpricing by disappointed

investors. They argue that companies underprice deliberately to prevent disappointed investors that could file companies with costly lawsuits, management distraction, reputation loss, losing customers and future difficulties in raising capital. Lowry & Shu (2002) validate this theory with empirical evidence that six percent of IPO firms were sued with average damages of 13.3% of the IPO proceeds. Other researchers including Jenkinson (1990) and Beller, Terai & Levine (1992) argue that this could be a local US effect due to its litigious culture as they find no evidence in the UK nor in Japan respectively for this effect. Most evidence on the trade-off between minimizing the litigation cost in the future and maximizing the gross proceeds for IPOs according to Hughes & Thakor (1992) is in countries where litigation liability is less than for instance the US.

A second institutional explanation for underpricing is the price stabilization hypothesis. This relates to the price support investment banks, as underwriter, offer to issuers to prevent potential price falls after issuing the shares (Booth and Smith, 1986). Empirical evidence is provided by Ruud (1993) for the US market. Stock prices are allowed to rise but are prevented from falling. However, it is hard to measure the magnitude and nature of the stabilization support (Jenkinson and Ljungqvist, 2001).

The tax argument is the last institutional explanation for underpricing. Rydqvist (1997) finds empirical evidence for underpricing assets in return for reduced salary for employees. The rationale behind this is the tax system. When the tax treatment of income compared to capital gains is higher, companies can decide to lower income and in return offer employees appreciating capital assets. In addition, several researchers such as Guenther & Willenborg (1999) found evidence that underpricing was reduced dramatically after removing the difference in income and capital gain tax. On the other hand, Uddin & Raj (2012) show that underpricing is still around in countries where there is no tax at all. Hence, other explanations of underpricing play a role in those cases.

2.1.3 Ownership and control

Sheifler and Vishny (1989) were among the first that conducted research on underpricing, control and ownership dispersion. The entrenchment managerial control hypothesis is empirically tested by Brennan & Franks (1997) and included the strategic allocation of underpriced shares to small outside investors to protect private benefits. This could contribute to entrenched management control due to post-IPO fragmented ownership and little external monitoring. Several papers raise concerns on this hypothesis as there are regional differences in the degree to which secondary shares are sold after going public. In developing and European

countries this level is far below compared to the United States and United Kingdom, which results in little incentive to underprice (Engelen and van Essen, 2010).

The agency cost hypothesis discusses a potential misalignment between managers and shareholders after the separation of ownership and control as well. In contrast to Brennan & Franks (1997), Stoughton & Zechner (1998) suggest that shareholders have incentives to underprice their stock at IPOs to attract large blockholders. Blockholders often plan to monitor managers well and so, minimize future monitoring costs themselves. This could lead to high value appreciation of firms post offering. However, Field & Sheehan (2004) find no significant empirical support of the above-mentioned relationship.

2.1.4 Behavioral explanations

In prior literature, behavioral explanations are presented for underpricing. Welch (1992) shows that cascade communication can affect underpricing. Late investors rely on investment decisions of earlier investors and set aside their own considerations (Jegadeesh, Weinstein & Welch, 1993). Positive bids will be followed up by positive bids of late-stage investors in the IPO, unsuccessful early-stage book building results in disappearing demand in late-stage demand (Pollock, Rindova & Maggiti, 2008). Additionally, Ljungqvist, Nanda & Singh (2004) argue that irrational sentiment investors can create a bubble in the IPO price. For the issuer it is important to slowly diminish that bubble. This is accomplished by pricing stocks not too aggressively to institutional investors. Loughran and Ritter (2002) discuss explanations for the fact that issuers underprice and leave money on the table during IPOs. The prospect theory is the foundation for this phenomenon. Companies that issue stock often forget the money left on the table and focus on the wealth effects after stock listings. All in all, it can be difficult to validate the cascade as bid patterns of IPO shares can be difficult to retrieve.

This paragraph summarized the academic literature on underpricing. Prominent explanations are information asymmetry, institutional, behavioral and ownership & control explanations. Now the concept of underpricing has been defined, the information disclosure concept is considered. This will be discussed in paragraph 2.2.

Table 1: Summary of underpricing theories

<i>Theory classification</i>	<i>Related literature</i>	<i>Findings</i>
Information asymmetry	The winner's curse (Rock 1986), Ex-ante uncertainty (Beatty & Ritter 1986), Information revelation (Benveniste & Spindt, 1989 and Hanley, 1993), Principal-agent model (Jensen & Meckling 1976) & Signaling model (Allen & Faulhaber 1989)	Underpricing is a compensation for uninformed investors. Underpricing is caused by ex-ante uncertainty on the value of stocks offered. Investors receive compensation for providing information in book building process. Underpricing signals good companies.
Institutional explanations	Legal liability (Logue 1973) and (Ibbotson 1975), Price stabilization (Booth and Smith, 1986), Tax advantages (Rydqvist 1997)	Underpricing to reduce potential lawsuits. To make sure stock price will not reduce the days after issuance. Tax advantages due to underpricing.
Ownership & control	Ownership & control (Sheifler and Vishny 1989)	Ownership dispersion, to reduce the agency costs between investors and companies.
Behavioral explanations	Cascades (Welch 1992), investor sentiment (Ljungqvist, Nanda & Singh 2004), prospect theory (Loughran and Ritter 2002)	Decisions of late investors dependent on previous ones. Optimistic view of issuing firm. Optimistic investors due to increased firm value.

2.2 Information disclosure, prospectuses & ESG

Information disclosure is expected to reduce information asymmetry in IPOs, the theory discussed in paragraph 2.1. Especially the ex-ante uncertainty around the value of issuing companies tends be lower after disclosing company information. Diamond and Verrecchia (1991) show that revealing public information can reduce a firm's cost of capital. Moreover, large companies tend to disclose more information since they benefit most by reducing information asymmetry. Healy and Palepu (1993) conclude that financial information disclosure is in the best interest of the company and used as a strategic tool to raise future capital at lowest costs. Furthermore, Richardson and Welker (2001) argue that quantity and quality of financial disclosure is negatively correlated with cost of equity for companies. Additionally, according to Verrecchia (2001) relevant non-financial information is expected to

lower the cost of equity due to lower uncertainty among investors about prospects. Several factors support these findings and influence disclosure levels such as: industry, managerial ownership, firm size, internationalization and firm age.

Industry differences are used to explain differences in information disclosure between different industries. Cooke (1989) explains that differences in disclosure are partly triggered by industry differences. In Cooke's paper, trading companies tend to disclose less voluntary information than in other industries. Lindh (1962) proved that uniformity in financial reporting in Swedish metalworking industry led to a specific level of disclosure across the entire metalworking industry. According to Gibbins et al. (1990) industry norms and corporate networks may influence the willingness in information disclosure and hence the amount of information output.

As section 2.1.3 described, Jensen & Meckling (1976) explain that outside shareholders will increase monitoring of managers when ownership falls. Ruland et al. (1990) find that as inside ownership increases, firms are less likely to provide earnings in disclosure documents. In line with this argument, outside managers perceive themselves in a monitoring role compared to managers that own shares themselves. Jaggi (2000) shows a relation between independent non-executive directors and comprehensiveness of information in mandatory financial disclosure. Outside directors tend to be more inclined to encourage firms to disclose more information to shareholders. Lastly, Eng & Mak (2003) find evidence for a significant relationship between lower manager ownership and increased voluntary disclosure.

Stranga (1976) concludes that size is not a significant factor in explaining differences in companies reporting. Robb et al. (2001) present evidence to the contrary in that companies with a global footprint tend to have higher levels of non-financial disclosures in annual reports. Diamond & Verrecchia (1991) show that larger firms disclose more non-financial information due to extra benefits in reducing information asymmetry. Normally, large firms have increased liquidity in their stocks, which results in the largest effect on the cost of equity. Chow & Wong-Boren (1987) find a significant relation between the disclosure extent and firm size in annual reporting. Meek et al. (1995) show that region influences level of information disclosure as well. Especially in strategic and non-financial disclosures European companies tend to outperform in disclosure compared to US and UK-based companies.

According to Kim and Ritter (1999) non-financial information is of greater importance in the valuation process of younger companies during IPOs as they have less historical earnings that can help in the valuation process. Older firms have a longer history and have more information available than younger enterprises (Ritter, 1984). This results also in less ex-ante uncertainty

about firm value and the level of underpricing will be lower for older firms. Other researchers such as Loughran & Ritter (2004) and Su & Fleisher (1999) confirm this hypothesis.

Apart from the above-mentioned factors that affect disclosure levels, the tone in which companies communicate to share information can influence uncertainty around the company. Loughran & McDonald (2013) find a relation between the tone of communication in the IPO filing to the Stock Exchange Commission and level of uncertainty in stock returns. High levels of uncertainty in text have higher first-day returns, lead to absolute offer price revisions and result in subsequent volatility. Furthermore, Hanley & Hoberg (2010) present evidence on information disclosure in the pre-market results in more accurate offer prices and less underpricing. Bajo & Raimondo (2017) add that media coverage of any kind conveys important information and lowers asymmetry resulting in less underpricing.

Most company information during IPOs is disclosed in the prospectuses a company files to the authorities. Hanley & Hoberg (2010) find that informative content in initial public offering prospectuses leads to higher accuracy in offer prices and in less underpricing. In addition, they present evidence on a relation between advisory fees and information content in prospectuses. Lastly, the authors find a difference between standard and informative content. Standard information requires more efforts in book building than informative content. This leads to confirmation of the trade-off between greater effort and costs in premarket information acquisition and costly book building. More premarket efforts lead to less underpricing and minimizing costs during the book building process.

ESG information became extra important among investors over the past years. Eccles et al. (2011) describe the willingness and interest of investors in ESG data. Equity investors value the non-financial information more than fixed-income investors. Moreover, there are geographic differences in relative importance between the environmental, social and governance scores. They conclude that there is an urge towards and growing market interest in nonfinancial information. Fatemi et al. (2018) describe a firm's ESG activities and its disclosure influence on firm value. In their research they find that when there is more disclosure positive or negative, the overreaction in valuations lowers. This means high positive ESG disclosure lowers the positive valuation effect and vice versa. Park & Patel (2015) present evidence that companies can reduce underpricing by presenting clear information about their quality. Over time, awareness has been raised among investors regarding ESG investing and the importance of ESG scores. According to prior studies, as attention to a phenomenon such as ESG disclosure of companies, becomes more widespread, relationships diminish due to increased investors' attention (Borgers et al., 2013). Moreover, Griffin & Mahon (1997)

conclude as well that corporate social performance and corporate finance performance of the past determine the relation of the two factors in the future. Moreover, Baldini et al. (2018) find evidence that country level characteristics such as a political system, labor system and cultural system significantly affect firms' ESG disclosure practices. This may differ per ESG pillar. Boulton et al. (2010) and Baker et al. (2021) find different underpricing in countries with different governance levels and different ESG government scores.

Table 2: Summary of information disclosure, Prospectuses and ESG literature

<i>Theory classification</i>	<i>Related literature</i>	<i>Findings</i>
Information disclosure	Financial disclosure and cost of capital (Diamond and Verrecchia 1991), Disclosure level in different industries (Cooke 1989), Inside ownership (Ruland et al. 1990), size effect disclosure (Robb et al. 2001) and age effect in non-financial disclosure level (Kim and Ritter 1999)	More financial disclosure leads to lower cost of capital. Disclosure levels differ across industries. Inside ownership lowers disclosure levels. Larger companies disclose more non-financial information. Younger firms have less financial information and need to compensate.
Prospectuses	Informative content (Hanley & Hoberg 2010)	More informative information leads to more accurate valuations and offer prices.
ESG	ESG interest of type investors (Eccles et al. 2011), lower overreaction in stock price (Fatemi et al. 2018) and clarity on ESG qualifications (Park & Patel 2015)	Equity holders are more interested in ESG than fixed-income investors. More disclosure leads to lower overreaction in prices. Quality on ESG can reduce underpricing.

3. Hypothesis development

The previous chapter discussed existing theory and empirical evidence on underpricing and information disclosure. This thesis focuses on the main determinant information asymmetry on underpricing in initial public offerings. Ibbotson (1975) and Ritter (1984) were among the first to document underpricing in stock markets. The hypotheses are divided in two sections. First, whether the disclosure rates are associated with firm, market and transaction characteristics. Secondly, the relation of underpricing with ESG disclosure will be investigated. I constructed the following hypotheses on information disclosure:

A study of Tinic (1988) showed that underwriters must examine and screen the company in detail, since they are responsible for an essential part of the prospectus. Hence, underwriter quality and rank are a certification and quality-check towards investors. This could imply that better underwriters result in better quality of ESG information and this could mean that high ranked underwriters result in lower underpricing. In addition, Ljungqvist & Wilhelm (2003) highlight that high quality underwriters will have more information on market demand, which leads to less underpricing. I argue:

H1A. IPOs with high-ranked underwriters are associated with increased ESG disclosure

Over time, awareness has increased among investors regarding ESG investing and the importance of ESG scores. According to prior studies, as attention to a phenomenon, such as ESG disclosure, becomes more widespread, relationships diminish due to increased investors' attention (Borgers et al., 2013). Moreover, Griffin & Mahon (1997) conclude as well that Corporate Social performance and corporate finance performance of the past determine the relation of the two factors in the future. It would be interesting to see whether ESG disclosure increased overtime due to social pressure from society to engage in ESG activities. Which leads to the following hypothesis:

H1B. The level of ESG disclosure increases over the years

Lindh (1962) states that financial information uniformity levels in a specific industry lead to similar levels of disclosure. Gibbins et al. (1990) confirm this finding together with Cooke (1989) and mention that corporate networks and industry norms influence information disclosure and hence the information output. Diamond & Verrecchia (1991) presented evidence about larger firms disclosing more non-financial information due to extra benefits in reducing

information asymmetry. Robb et al. (2001) support these findings and state that companies with a global footprint tend to disclose more voluntary information in annual reports. Lastly, Ritter (1984) argues that older companies have more information available. Therefore, the following hypotheses are constructed:

H1C. ESG disclosure among large firms is associated with more information disclosure

And

H1D. The level of ESG disclosure is not consistent across industries

And

H1E. The level of ESG disclosure is associated with firm age

Rock's (1986) constructed the Winner's curse model as explanation of underpricing, that was supported by a considerable number of empirical papers. Beatty & Ritter (1986) suggested ex-ante uncertainty as main driver of underpricing. Other explanations include the information relevance theory by Benveniste & Spindt (1989) and the contradicting signaling model by Allen & Faulhaber (1989). Information disclosure would imply lower underpricing among IPO parties since information asymmetry is lower. This leads to the following hypothesis:

H2A. High disclosure issuing firms are associated with lower levels of underpricing than firms with lower ESG disclosure levels

Following the hypotheses stated in the information disclosure section and literature introduction of those topics, the following hypotheses are constructed regarding underpricing. High quality underwriters are associated with less underpricing (Ljungqvist & Wilhelm, 2003). Verrecchia (2001) presents evidence on the relation between firm age, uncertainty. Whereas Ritter (1984) presented evidence for a relation between firm age and underpricing. Jenkinson & Ljungqvist (2001) amongst others, presented evidence on the relation between underpricing and uncertainty. Larger firms tend to have less uncertainty which results in less underpricing. Cooke (1989) presented evidence about industry effects on information disclosure. Information asymmetry can lead to underpricing. The related literature leads to the following hypotheses:

H2B. IPOs with high-ranked underwriters are associated with less underpricing

H2C. Larger firms are associated with lower levels of underpricing

H2D. The level of underpricing is different across industries

H2E. Older companies are associated with less underpricing

4. Data and Methodology

This chapter describes the data and methodology utilized in this study for the analyses on the relation between ESG disclosure and firm, market and transaction characteristics as well as the relation between ESG disclosure and underpricing. Additionally, it provides an overview of the data sample and it explains the definitions of the variables. Lastly, it provides the descriptive statistics of the data.

4.1 Sample collection

As this study focuses on the influences on ESG disclosure and IPO underpricing, a sample of US companies is taken based on public issuing dates. A multi-stage data gathering process is applied to compile all data. First, the disclosure levels are determined by text analyses of IPO prospectuses. There are several reasons for using prospectuses as proxy for information disclosure. First, prior literature such as Hanley & Hoberg's (2010) paper classify IPO prospectuses as an excellent proxy for information disclosure. The main reason is that prospectuses are created to inform investors and authorities to limit adverse selection in the book building process. Several other studies show further evidence such as Beattie (1999). Cumby & Conrad (2001) are convinced of the information value of prospectuses as prospectuses are future-oriented and more open. Daily et al. (2003) suggest that information in prospectuses is very accurate as companies can be fined for inaccurate and misleading company information in this document. For this reason, this disclosure document is a very comprehensive presentation of the company's key information and is widely acknowledged within the financial world. Additionally, the information disclosed in prospectuses often includes all published pre-IPO information through other channels and provides an overview of the quality of the IPO for potential investors. Lastly, most information that financial analysts share with the company during the book building process will be incorporated in the prospectuses.

The prospectuses (S-1 file) are filed with the Security Exchange Commission (SEC) in the United States during the IPO process. Most companies often update the document in the pre-IPO period. To examine the disclosure level of companies in IPOs, data is retrieved from the SEC Electronic Data Gathering Analysis and Retrieval (EDGAR) database. This database contains all required corporate filings such as IPO prospectuses, annual reports and ownership reports of US listed companies as of 2001.

The prospectuses can be analyzed both using qualitative and quantitative methods. This paper applies the quantitative method to analyze the prospectuses. In the filings, specific words are searched for to measure the level of disclosure on environment, social and governance matters. The word lists are constructed in line with Baier et al. (2018) who performed a similar study on annual reports. Using R, with support of the Application Programming Interface (API) EDGAR package, all prospectuses' data from 2014-2020 are downloaded. After downloading, the text files are searched for words occurring in the ESG word lists, then these recognized words are summed, and the total number of words found is calculated. This results in the construction of various disclosure level variables. The construction of the ESG variables is further specified in section 4.3.

This paper uses the EDGAR database to acquire all data on disclosure levels during IPOs. Prices, firm characteristics, offer characteristics and market characteristics are important additional variables necessary to draw conclusions about the effect of disclosure on underpricing information. Our primary source for the other IPO data over 2014-2020 is the Thomson One Reuters database. Filing, issue and founding dates are obtained from Thomson One, as well as all stock price data, VC dummy, technology dummy, underwriter rank, gross proceeds and type of industry. Index Key (CIK) number. The variables compiled from the various databases are further discussed in section 4.3.

4.2 Sample selection criteria and construction

The dataset that is extracted from the EDGAR database consists of many files, the downloading process of all S-1 files between 2000-2020 is time consuming and, therefore, a selection was made consisting of the years 2014-2020. Furthermore, every company that goes public has several versions of the S-1 filing, as information is updated during the IPO process as soon as more information becomes available. This paper uses the latest filing before IPO as the most accurate filing, as most information is incorporated in the latest filing. Often investors disclose information to underwriters, market circumstances change, or news is published in the period between the first filing and the latest. Another aspect in selecting the sample is the exclusion of financial firms (6000-6999) and utilities (SIC 4900-4999) for the underpricing hypothesis. Banks and insurance companies are obliged to meet many regulatory capital requirements and utility companies are very dependent on regulators as well. For this reason, these companies regularly have very specific motives for issuing equity to capital markets, which could potentially confound the results (Kennedy, Sivakumar & Vetzal, 2006). In addition, recently a

lot of Special Purpose Acquisition Companies (SPACs) have been issued. They disclose limited amount of information as they issue only to raise capital and in a later stage acquire companies. Motives of issuance have no impact on the information disclosure hypotheses. However, they can have an impact on the underpricing of companies. The following inclusion criteria are also applicable to this study: an offer price of \$5 per share or higher, gross proceeds of at least \$5 million, common stock issuance, underwriter involved and the stock is listed on the Nasdaq or NYSE.

4.3 Variables

4.3.1 Dependent variables

The first variable in this study, information disclosure, will be used as dependent and independent variable. As stated in the hypothesis development section, it will be applied as dependent variable to determine whether specific factors specified in the literature review have their influence on disclosure levels of companies. As dependent variable, absolute information disclosure will be log transformed before being used. Due to normal distribution issues of the dependent variable as shown in the appendix. For relative information disclosure, normal distribution is assumed. However, this variable will predominantly be utilized as independent variable to determine whether information disclosure has a negative relation with underpricing. During the preparation process of an Initial Public Offering, news and information regarding the company will be distributed through different information channels. As stated in the data collection section, Hanley & Hoberg's (2010) among others use the prospectuses as proxy for information disclosure. The variable "creation of information disclosure" will be further explained in the independent variable section.

Underpricing will be used as dependent variable in this research to measure the level of underpricing in the first day of going public (Loughran & Ritter, 2004). In line with earlier studies (Loughran & Ritter, 2004 and Lowry & Schwert, 2002), the level of underpricing is defined as the first-day initial return. This first-day initial return is calculated as the difference between the closing price in the stock market and the offer price, divided by the offer price of the specific company. The variable is defined as the first-day initial IPO return, Loughran (2002) specified the amount of underpricing as how much money is left on the table. The formula of the dependent variable is:

$$IPO \text{ underpricing} = \frac{\text{Closing price of the first day} - \text{Offer price}}{\text{Offer price}} * 100(\%)$$

4.3.2 Independent variables

The primary independent variable in this study will be information disclosure on ESG. As described in the sample collection section, information disclosure levels per company are retrieved from IPO prospectuses in the EDGAR database of the SEC. With support from a specific R package named EDGAR the prospectuses are collected. Consequently, words that appear in respectively the environmental, governance or social wordlist will be counted. The frequency term method is used in several other studies including Wilmshurst & Frost (2000) and Loughran et al. (2009) and the absolute word count could be a proxy of ESG disclosure in IPOs. Critics of this method, Loughran & McDonald (2016) say it is important to include a weighted scheme to make words relative to other content in the prospectuses. The absolute method results in four disclosure levels. For every category, a separate disclosure level and a combined ESG disclosure level with the sum of the three categories is constructed. Due to required methodology adjustments the Total ESG rate is based on the sum of three separate ESG standard deviations, divided by 3. The Total ESG absolute rate is largely dependent on governance disclosure. To test the total ESG effect in a proper way, this paper uses the standard deviation of the three separate ESG indicators. However, for ln transformed variables this method is not applicable. As noted, absolute disclosure rates are also ln transformed as independent variable due to the skewed distribution of the residuals. The second method to measure the level of information disclosure regarding ESG is based on the term frequency – inverse document frequency weighting scheme. This method, recommended by Loughran & McDonald (2011), is based on the importance of the terms in the sample. This means that terms that are found in more prospectuses of the sample will have more weight than other terms.

$$W_{i,j} = \frac{1 + \log(tfi,j)}{1 + \log(aj)} * \log \frac{N}{dfi} \text{ if } tfi,j > 0$$

With:

$w_{i,j}$: the weighted term frequency of term i in document j

$t_{fi,j}$: the unweighted term frequency of term i in document j

a_j : the average term frequency in document j

N : the number of IPO prospectuses in the sample

df_i : the number of IPO prospectuses used the term i at least one time.

After calculating the weighted term frequency of every term in every document this paper uses the mean of all terms to construct an average weighted disclosure rate per IPO on all ESG factors.

The bookrunning rank is a crucial aspect in the IPO process according to Carter & Manaster (1990). The reputation of an underwriter can influence important parts of the offering. Underwriters with a high reputation diminish the risk perceived by investors. Prestigious underwriters have a great network with investors, coverage analysts and other people in the financial world which makes it more cost-efficient in several aspects of the process compared to non-prestigious underwriters. Management fee is the last offering characteristic and can be used as proxy of the uncertainty regarding the company. According to Habib & Ljungqvist (2001) management fees tend to be higher for companies with higher uncertainty due to underwriters who spend more time and effort on these IPOs. Costs are higher for these types of public offerings. In this study, the underwriter rank is based on the first investment bank mentioned in the dataset. This bank is extracted and linked to underwriter's ranking. This is a proxy for underwriter ranking.

Furthermore, Ritter (1984) argues to control for year of issuance, as extreme market circumstances can influence the level of underpricing during bullish respectively bearish sentiments. According to Ibbotson, Sindelar & Ritter (1988) and Mikkelson & Partch (1997) among others argue that firm size is an important factor in a firm's performance. Smaller firms are more exposed to ex ante uncertainty, which leads to higher underpricing for smaller stocks. Besides, larger companies tend to have easier valuation metrics compared to smaller companies (Booth & Chua, 1996) and the perception of investors in the past has its influence on future performance. Firm size is calculated in line with Ljungqvist & Wilhelm (2003) and Park, Borah & Kotha (2016) by the log function of sales revenue of the past twelve months before the public offering. Revenue is preferred above assets in place as some companies (e.g. internet companies) tend to have fewer assets than industrial companies.

As stated in the literature section, disclosure rates can differ across industries due to different disclosure standards. Regarding industry, the industries are divided by SIC codes into main industries.

Age is an important firm characteristic, according to Carter, Dark & Singh (1998) and Lowry, Officer & Schwert (2010) there is more ex-ante uncertainty and information asymmetry among younger companies compared to older companies. Age is created by calculating the issuing year – founding year.

Along with underpricing as dependent variable and independent variables, many control variables are included in line with previous literature. Research on underpricing resulted in a wide range of variables that could affect underpricing. For example, firm, offer and market characteristic variables. In the following section a set of control variables is described.

4.3.3 Control variables

The control variables are divided into three different categories. First, the firm characteristics will be discussed as control variables, Secondly, this research will control for the offer characteristics during public offerings. Lastly, this paper will consider the market characteristics during the public offerings.

The third control variable is the VC-involvement variable. VC-involvement firms have more underpricing compared to other companies. When companies have prior IPO-venture capital owners underpricing tends to be more as well (Lowry & Schwert, 2004).

Gross proceeds refer to the size of the company that offers its shares during a public offering. As stated above, the size of the offering influences the perception of investors. Most investors tend to prefer well established companies (larger companies) as the uncertainty around valuation and establishment of the company is higher. Companies with higher offerings should be less underpriced. Offer price revision is a phenomenon that occurs as a compensation of information to investors. The offer price revision will have a positive relation with the level of underpricing. Price revisions tend to be more when there is more positive information revealed and less when negative information is shared. This is because negative information leads to lower offering prices and vice versa. This is based on the information revelation theory of Benveniste & Spindt (1989) which states that informed investors desire compensation for information on valuations they provide to the underwriters.

According to Beatty & Ritter (1986), firms that have their listing on the Nasdaq tend to have more underpricing. The reasoning behind this is that stocks that list on the Nasdaq often have characteristics such as small, young, and high technology.

In the end gross proceeds and Offer price revision are excluded in this research. The gross proceeds variable is covered by the size measure revenue and for Offer price revision the data was insufficient.

4.4 Methodology

4.4.1 Information disclosure

In this study, Ordinary Least Squares (OLS) and log transformation will be used to assess the hypothesized effects on the dependent variable for the information disclosure hypotheses. In addition, prior studies on count data and checking robustness during this study have led to these various methods. More details regarding the count data will be discussed in the descriptive statistics and results section. Furthermore, the log transformed OLS model is used for the information disclosure hypotheses before robustness checks. However, after robustness checks the OLS will only be used for the underpricing hypotheses.

(1)

$$\begin{aligned} \ln(\text{ESG indicator}_i) &= \beta_0 + \beta_1 \text{Highranked underwriter} + \beta_2 \text{Timedummy} + \beta_3 \text{Size}_i + \beta_4 \text{Industry}_i \\ &+ \beta_5 \text{Stockexchangedummy} + \text{Controls}_i + \varepsilon_i \end{aligned}$$

The ESG indicator is, as described in the variables section, an absolute count and the mean weighted count. In the models, the ESG indicator is also divided into environmental, social and governance indicators. In total, there are seven final models for the information disclosure hypotheses. The absolute disclosure rates are the main variables to be used. The weighted variables are a robustness check on the results. As stated in the variables section, the Total ESG was adjusted to test the correct effect of the hypothesized effects on the total ESG disclosure.

4.4.2 Underpricing

OLS is suitable for IPO topics on cross-sectional data with continuous dependent variable underpricing. In the second hypotheses models, the dependent variable underpricing will be regressed on the independent variables including Underwriter ranking, year of issuance, $\ln(\text{size})$ and industry. Further control variables which have been explained in previous sections are also introduced.

For the other hypotheses the following regressions are constructed.

$$\begin{aligned} (2) \\ \text{UP}_i &= \beta_0 + \beta_1 \text{ESG indicator}_i + \beta_2 \text{Highranked underwriter} + \beta_3 \text{Timedummy} + \beta_4 \text{Size} \\ &+ \beta_5 \text{Industry} + \beta_6 \text{Stockexchangedummy} + \text{Controls}_i + \varepsilon_i \end{aligned}$$

In these OLS regressions, the underpricing dependent variable will be regressed on the hypothesized effects described in the hypothesis development. Several control variables are included to further reduce the bias effects of the independent variables.

4.5 Descriptive statistics

This section provides an overview of the IPO firms, the ESG disclosure rates, firm age, year of issuance, firm size, industries and underwriter reputation and their descriptive statistics. It also presents the number of IPOs and disclosure levels over time and a correlation table of the variables. Furthermore, for the second hypothesis, the financial and utility companies are

Table 3: Summary statistics

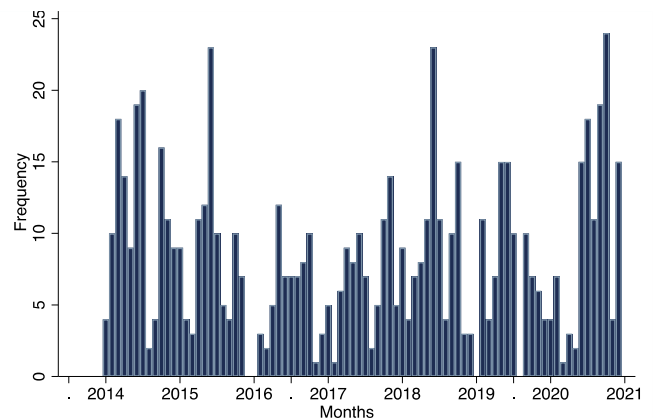
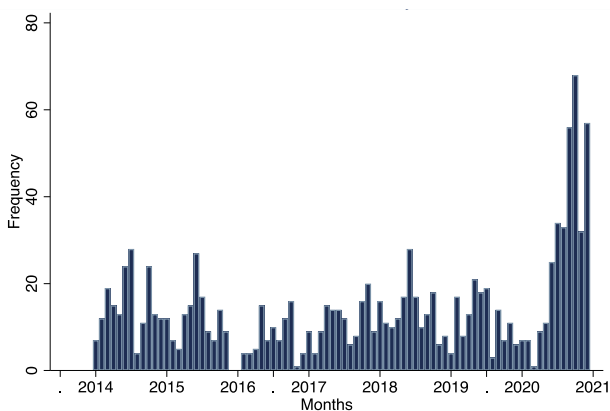
Panel A

	N	Mean	Std. Dev.	min	p25	Median	p75	max
Information disclosure characteristics								
ESG disclosure	1174	27.506.437	27.961.870	622	9661	18875.5	34360	187787
Environmental disclosure	1175	479.688	696.825	1	52	208	571	8483
Social disclosure	1177	600.244	594.206	2	141	350	930	3834
Governance disclosure	1178	26.413.253	27.266.100	581	9369	17902.5	32736	186678
Mean environmental disclosure	1175	.042	0.060	.009	.02	.028	.047	1.338
Mean social disclosure	1177	.016	0.019	.004	.008	.011	.017	.431
Mean governance disclosure	1178	.023	0.014	.001	.015	.019	.028	.105
Transaction characteristics								
Underpricing	1067	16.271	32.449	-43.778	0	3.13	23.333	231.25
Offer Price	1179	19.438	178.114	5	10	13	17	6125
Gross Proceeds	1179	54.444.432	133.073.076	5.28	105.3	250.7	25025	879463
Revenue in M	754	850.42	2.084.085	0	50.3	230.6	746.2	30398.9
Underwriter ranking	1137	7.516	2.437	0	7.001	8.501	9.001	9.001
Firm and market characteristics								
Firm age	828	8.285	12.135	0	1	5	10	91
High Technology	1179	.436	0.496	0	0	0	1	1
Stock exchange	1179	.3	0.459	0	0	0	1	1
VC-backed	1179	.344	0.475	0	0	0	1	1

excluded. Therefore, some descriptive statistics will be presented twice. Table 3 presents the most important characteristics. Panel A shows the sample descriptives for the first hypothesis. Panel B presents the underpricing sample descriptives.

The average Total ESG lies at 27499 words per prospectus. Environmental, Social and Governance are respectively 480, 599 and 26407. There is large discrepancy between environmental and social on one side and governance on the other side. Disclosure on governance is far more incorporated in prospectuses than the two other components. On weighted disclosure levels environmental disclosure has a value of 0,042 and governance and social respectively 0,023 and 0,016 on average. This says that the environmental words have on average lower mean of the terms in the word lists, or that on average the terms used in environmental are more unique and therefore important which leads to higher mean weighted value than governance and social mean weighted values.

The transaction characteristics contain various variables. The mean underpricing in the sample is 16%. The average offer price is 19,36\$ per share. On average the companies that went public had a revenue of 848 million dollars. The average underwriters ranking was 7.49. The ranking has a scale from 0 until 9.1 Moreover, the underwriters ranking is based on the first underwriter in every transaction. This is the proxy for the ranking based on Ritter’s underwriter ranking. The average firm age in this sample 8.3 years. Furthermore, included in the sample are 43.8% technology firms according to Thompson one standards. 70% of all the stock issues are listed on the Nasdaq, the rest is listed on the NYSE. A large part of the sample is backed by VC according to Thomson one Reuters standards.



In the two charts above the total amount of IPOs is presented per year. On the left the large sample is presented and on the right the sample without financials and utility companies. Especially with financials included, there is a large difference in issuances in the large part of the data sample. After the COVID outbreak a lot of SPACs were issued. This results in a higher frequency in the left chart.

Panel B

	N	Mean	Std. Dev.	min	p25	Median	p75	max
Information disclosure characteristics								
ESG disclosure	691	30.505 .414	26.758.3 14	666	13480	24206	38152	175881
Environmental disclosure	692	568.35 4	626.238	1	129.5	380	712.5	3822
Social disclosure	694	836.86 7	632.590	2	317	732.5	1280	3834
Governance disclosure	695	29.061 .193	26.076.8 07	645	12852	22753	36534	173681
Mean environmental disclosure	692	.037	0.073	.009	.017	.022	.031	1.338
Mean social disclosure	694	.015	0.024	.004	.008	.009	.012	.431
Mean governance disclosure	695	.024	0.016	.001	.014	.018	.028	.105
Transaction characteristics								
Underpricing	654	23.715	38.468	-43.778	0	13.333	36.842	231.25
Offer Price	696	24.373	231.725	5	12	15	18	6125
Gross Proceeds	696	64.715 .109	139.927. 533	5.28	80.98	212.405	74276.5	879463
Revenue in M	544	862.68 3	2.147.36 5	0	35.45	216.25	710.45	30398.9
Underwriter ranking	669	7.68	2.551	0	8.001	9.001	9.001	9.001
Firm and market characteristics								
Firm age	535	10.08	11.916	0	4	7	12	91
High Technology	696	.733	0.443	0	0	1	1	1
Stock exchange	696	.236	0.425	0	0	0	0	1
VC-backed	696	.565	0.496	0	0	1	1	1

The table 3 below presents all descriptive statistics for the second part of the research. In this sample, the Financial and Energy & Power industry are removed. On average all information

disclosure rates are increasing in this sample compared to the larger sample. This might be influenced by all SPACs in the financial industry that their disclosure contains little information. as the company issues stocks to acquire a company in a later stage.

In this smaller sample, there is more underpricing compared to the larger sample. The offer price is higher and the proceeds and size of the IPO and company are also higher. The underwriter ranking also tends to be higher compared to the other sample.

In this sample, the age of the firms is much higher compared to the large sample. There are more technology stocks. This is confirmed by the increase in Nasdaq listings. 76,6% are listed on the Nasdaq. The rest is issued on the NYSE. On average, half of the company is backed by VC.

In table 4, the sample is presented per industry. This shows that there are a lot of financial and Energy & power companies. As discussed, these companies are excluded in the second hypothesis. Secondly, there is a focus on high-technology industry and healthcare companies.

Table 4: observations per by industry

Industry	Freq.	Percent	Cum.
Consumer Products and Services	37	3.11	3.11
Consumer Staples	9	0.76	3.86
Energy and Power	54	4.53	8.40
Financials	433	36.36	44.75
Healthcare	377	31.65	76.41
High Technology	155	13.01	89.42
Industrials	33	2.77	92.19
Materials	24	2.02	94.21
Media and Entertainment	17	1.43	95.63
Real Estate	5	0.42	96.05
Retail	41	3.44	99.50
Telecommunications	6	0.50	100.00
Total	1191	100.00	

In the appendix a table can be found that presents the pair-wise correlation coefficient matrix between the main variables used in this study. A correlation table provides insights into the linear relationship between the variables that are used in the research. As expected, the correlation between the various information disclosure levels is positive and high. In addition, the hypothesized effects between the variables discussed in the hypothesis development section are found in the correlation matrix as well. The correlation between the information disclosure rates is high. However, these disclosure rates will not be used at the same time in the regression analyses. Furthermore, the correlation between underpricing and information disclosure is

significant, but lower than the 0.4 threshold. Therefore, in general the multicollinearity will not be critical for the regression analyses. Besides, the Variance Inflation Factor (VIF) will be calculated to additionally check for multicollinearity. The threshold for unstable coefficients lies between 5 and 10. Multicollinearity will be a problem with a VIF above 10 and critical above 5. All the variables are below 5 except for one, that was just over 5. All variables are considered in this study.

5. Results

This section describes the results of the research methodology presented in chapter 4. In section 5.1, the relation between information disclosure rates and firm, transaction and market characteristics is analyzed. An Ordinary least square regression is performed to examine whether there is an association between information disclosure and all the characteristics that are involved. First, the impact of the characteristics on total ESG disclosure is examined, followed by the relation with total environmental disclosure, social disclosure and governance disclosure. Secondly, as a robustness check the absolute information disclosure rates are replaced by the weighted information disclosure levels. This is displayed in the second part of the 5.1 section.

This is followed by the second set of hypotheses in section 5.2 investigating the impact of information disclosure levels, firm, transaction and market characteristics on underpricing. Again, ordinary least squares are used in this section. The results are checked on robustness in the last section of the chapter.

5.1 ESG information disclosure

The first section of the results presents the results of the firm, market and transaction characteristics on information disclosure. The data consists of the full sample minus the missing values in the various included variables. Many values are missing due to data limits and ln conditions in the regressions. Table 5 presents the least squares results of the first set of hypotheses. In the OLS regressions model 1 to model 4 the effects on absolute ESG information disclosure have been researched. The results indicate that firm age and underwriter ranking are significantly positively associated with absolute ESG information disclosure, within the US stock market. The coefficients of model 1 to 4 show that, for our sample a 1% increase in firm age is associated with a 0.116% to 0.161% increase in information disclosure with various control variables included. This means that the size for this effect is approximately equal across the four regression models and therefore considered as robust. However, the significance level for environmental disclosure is lower than the other disclosure levels. In other words, older companies are associated with more disclosure on environment, social and governance disclosure in their prospectuses. This is in line with literature on firm age from Ritter (1984) and confirms hypothesis 1E.

Table 5

This table contains the results of the ordinary least squares regressions of transaction, market and firm characteristics on the absolute disclosure level of ESG during IPOs. The dependent variables are calculated as the natural logarithm of the four absolute disclosure levels. The main independent variables comprise firm age, firm size, stock exchange, VC-backed and underwriter ranking. Firm age and firm size are included as natural logarithm variables. The base case stock exchange dummy is the NASDAQ and value 1 is NYSE. VC backed is 0 without venture capital involvement and 1 with venture capital involvement during IPO. Other control dummy variables comprise year of issuance and industry. ***, ** and * indicate the significance at the 1%, 5% and 10% significance levels.

Dependent variable	ESG disclosure	Environmental disclosure	Social disclosure	Governance disclosure
Variables	Model (1)	Model (2)	Model (3)	Model (4)
ln(1+Age)	.124*** (.003)	.116* (.071)	.161*** (.001)	.126*** (.003)
ln(Revenue)	.023 (.394)	.036 (.364)	.036 (.238)	.023 (.379)
Stock exchange	-.088 (.385)	-.095 (.539)	-.105 (.332)	-.086 (.394)
VC-backed	-.032 (.767)	.225 (.17)	.139 (.266)	-.03 (.775)
Underwriter ranking	.059*** (.008)	.066* (.058)	.048* (.08)	.056** (.01)
Constant	9.418*** (0)	4.642*** (0)	5.264*** (0)	9.391*** (0)
Observations	532	533	535	535
Adj R ²	.053	.108	.201	.056
Year Dummy	YES	YES	YES	YES
Industry Dummy	YES	YES	YES	YES

Besides, the results indicate that the underwriter ranking is positively associated with information disclosure. This paper finds that in our sample, an underwriter score is on average associated with a 4.6% to 6.6% increased information disclosure level after controlling for several control variables. The size for this effect is approximately equal across the regression models, which indicates there is no difference within the different types of disclosure. However, in terms of significance, there is a lower significant association for environmental (*), social (*) and governance (**) compared to the total ESG disclosure level. All in all, this means underwriters with a better reputation are associated with higher levels of ESG disclosure. This is in line with hypothesis 1A and confirms previous literature on the influence of underwriters on the information presented in prospectuses. Tinic (1986) stated that high-ranked underwriters have a quality control on information towards investors. Which leads to better information presentations in prospectuses.

In addition to the above-mentioned general effects, results from model 1 present additional evidence regarding information disclosure. In the regression models 1-4 two dummy variables are included: Year and Industry. Results show that on average, in this dataset, companies in the Healthcare industry tend to disclose less in terms of total ESG compared to the base case industry. The disclosure on total ESG was 37% lower compared to consumer products & services. Furthermore, the results present evidence that in 2020 there was significantly more ESG disclosure compared to the year 2014, at the beginning of the dataset. In 2020, there was on average 27.1% extra total ESG disclosure compared to 2014.

Model 2 presents similar results for absolute information disclosure on environmental level regarding industries and years. On environmental topics, this paper finds a very significant positive effect of 127% compared to Consumer Products & Services for disclosure by Energy & Power companies. Furthermore, there is a significant negative association between environmental disclosure and financial companies. Financial companies disclose 61% less on environmental topics compared to consumer product & services companies. Additionally, this model shows a positive relation between 2020 and environmental information disclosure (***). In 2020 there was on average 70% more environmental disclosure compared to 2014.

In model 3, the social disclosure is associated with negative disclosure levels in various sectors. The industries Consumer staples, Energy & Power, Financials, Materials and Real Estate are all industries associated with lower social disclosure levels. For 2020, social disclosure levels were 72% compared to 2014 levels (***). In model 4, there is a significant increase (**) of governance disclosure in 2020 of 25% compared to 2014 and a significant negative effect of -40% governance disclosure in the Healthcare sector.

All in all, the four above mentioned models present evidence that can confirm hypothesis 1A and 1E. In addition, across the four models different industry effects were found which confirm hypothesis 1D. However, on increased ESG disclosure over time and the hypothesis on firm size no evidence can be found.

As there are various views on absolute and relative disclosure levels, this paper additionally presents relative disclosure rates as dependent variable. This can be seen as a robustness check for the findings presented in table 5. These results will be discussed very briefly. In table 6, the results are shown separately for environmental, social and governance disclosure. Total

Table 6

This table contains the results of the ordinary least squares regressions of transaction, market and firm characteristics on the relative disclosure level of ESG during IPOs. The dependent variables are calculated as the three relative disclosure levels. The main independent variables comprise firm age, firm size, stock exchange, VC-backed and underwriter ranking. Firm age and firm size are included as natural logarithm variables. The base case stock exchange dummy is the NASDAQ and value 1 is NYSE. VC backed is 0 without venture capital involvement and 1 with venture capital involvement during IPO. Other control dummy variables comprise year of issuance and industry. ***, ** and * indicate the significance at the 1%, 5% and 10% significance levels.

Dependent variable	Mean environmental disclosure	Mean social disclosure	Mean governance disclosure
Variables	Model (1)	Model (2)	Model (3)
ln(1+Age)	-.002 (.293)	-.003* (.078)	-.001 (.233)
ln(Revenue)	-.002* (.06)	-.001 (.121)	0 (.601)
Stock exchange	0 (.946)	.002* (.082)	.002 (.329)
VC-backed	.004 (.341)	0 (.9)	0 (.778)
Underwriter ranking	0 (.834)	0 (.154)	0 (.295)
Constant	.042*** (0)	.025*** (0)	.023*** (0)
Observations	533	535	535
Adj R ²	.052	.065	.056
Year Dummy	YES	YES	YES
Industry Dummy	YES	YES	YES

disclosure is excluded in this set of models as the relative method has no metric for total disclosure. In model 1, there is significant negative association found between size and environmental disclosure. 1% extra revenue leads to a decrease of relative environmental disclosure of 0.00002. In addition, the industries Financials and Media & Entertainment are positively associated with relative environmental disclosure, 0.00017 and 0.00013 respectively. Besides, there is a significant positive effect in the year 2015 on relative environmental disclosure of 0.0001. Surprisingly, there is a contradicting effect compared to the absolute disclosure levels regarding the year 2020. In 2020, there is significant negative association with relative environmental disclosure of 0.00009.

Model 2 shows, surprisingly, a negative association between relative social disclosure and firm age. An 1% increase in firm age leads to a decrease of 0.000027 in relative social disclosure. In addition, there is a slightly significant effect of the variable stock exchange on relative social disclosure. Stocks that list on the NYSE disclose 0.002 more on relative social topics. Lastly, in 2016 there is a significant positive effect on relative social disclosure of 0.006.

Lastly, model 3 presents only significant associations of relative governance disclosure with one industry and in one year. For the Real Estate, there is significant higher relative governance disclosure of 0.008. For 2018, there is a significant negative association of 0.006 compared to the year 2014.

Except for the industry effect, the relative metric does not present any substantial confirming evidence for the absolute metric. However, it does present some contradicting evidence on the association of firm age with social disclosure and stock exchange with social disclosure.

5.2 Underpricing

Table 7 and 8 present output describing the underpricing effect in the dataset. Models 1 to 4 cover the effect of absolute disclosure of ESG on underpricing. In these models, the dependent variables are regressed on various independent variables and control variables. Similar to the information disclosure section, the regressions are split into two different tables. In Table 7, model 1 to 4 find no significant relation between absolute information disclosure on ESG and underpricing. From the firm age perspective, a slightly significant positive effect is found in model 3, where social disclosure is included in the model. Results show that underpricing is 0.034% higher when firm age increases with 1%.

Table 7

This table contains the results of the ordinary least squares regressions of transaction, market and firm characteristics on the level of underpricing during IPOs. The dependent variables are calculated by dividing the $((\text{Closing price after one day} - \text{Offer price}) / \text{Offer price}) * 100\%$. The main independent variables comprise absolute disclosure levels, firm age, firm size, stock exchange, VC-backed and underwriter ranking. Firm age and firm size are included as natural logarithm variables. The base case stock exchange dummy is the NASDAQ and value 1 is NYSE. VC backed is 0 without venture capital involvement and 1 with venture capital involvement during IPO. Other control dummy variables comprise year of issuance and industry. ***, ** and * indicate the significance at the 1%, 5% and 10% significance levels.

Dependent variable	Underpricing			
	Model (1)	Model (2)	Model (3)	Model (4)
ln(ESG disclosure)	2.019 (.258)			
ln(environmental disclosure)		1.648 (.181)		
ln(social disclosure)			-1.632 (.339)	
ln(governance disclosure)				2.016 (.255)
ln(1+Age)	3.06 (.109)	2.927 (.124)	3.401* (.081)	3.041 (.111)
ln(Revenue)	-.533 (.738)	-.507 (.749)	-.351 (.824)	-.503 (.75)
Stock exchange	-3.761 (.411)	-3.718 (.414)	-3.642 (.425)	-3.834 (.394)

VC-backed	8.363 (.129)	7.976 (.149)	8.424 (.117)	8.289 (.127)
Underwriter ranking	1.716 (.117)	1.716 (.117)	1.963* (.064)	1.739* (.098)
Constant	-28.089 (.21)	-16.636 (.291)	-1.365 (.936)	-28.187 (.205)
Observations	382	383	385	385
Adj R ²	.084	.085	.083	.084
Year Dummy	YES	YES	YES	YES
Industry Dummy	YES	YES	YES	YES

In addition, models 3 and 4 show a significant association of underwriter ranking and underpricing. In model 3, 1 point higher in underwriter ranking leads to 1.963% more underpricing and for model 4, this is 1.739%. For both the underwriter ranking and firm age hypothesis regarding social disclosure, contradicting results are presented in this results section compared to related literature of Ljungqvist & Wilhelm (2003) and Ritter (1984). Therefore, hypothesis 2B and 2E cannot be accepted. According to Allen & Faulhaber (1989) among others, reasons for these results could be the signaling theory that higher quality companies are capable of more underpricing.

Besides the general outcomes in the four models regarding underpricing, there are several specific outcomes per model. In model 1, there is a significant positive association between the Retail industry and underpricing. Compared to the Consumer Products and Services industry, the Retail industry shows 23.8% more underpricing. Furthermore, model 1 finds that 2020 is associated with significantly more underpricing compared to 2014. In 2020 there was a highly significant 27.6% more underpricing. For model 2, the same results are valid as in model 1. 23.7% more underpricing for Retail and 27.2% more underpricing in 2020. In model 3 there is 23.6% more underpricing in retail and 10.4% in 2018 and 29.5% in 2020. In model 4 it is 23.8% and 9.2% in 2018 and 27.6% in 2020. This confirms hypothesis 2D on industry based on indirect previous evidence of Cooke (1989) which argued differences in information disclosure across industries. For hypothesis 2A and 2C no relations are observed.

Table 8

This table contains the results of the ordinary least squares regressions of transaction, market and firm characteristics on the level of underpricing during IPOs. The dependent variables are calculated by dividing the ((Closing price after one day - Offer price)/Offer price)*100%. The main independent variables comprise relative disclosure levels, firm age, firm size, stock exchange, VC-backed and underwriter ranking. Firm age and firm size are included as natural logarithm variables. The base case stock exchange dummy is the NASDAQ and value 1 is NYSE. VC backed is 0 without venture capital involvement and 1 with venture capital involvement during IPO. Other control dummy variables comprise year of issuance and industry. ***, ** and * indicate the significance at the 1%, 5% and 10% significance levels.

Dependent variable	Underpricing		
	Model (1)	Model (2)	Model (3)
Mean environmental disclosure	-49.682 (.182)		
Mean social disclosure		6.292 (.903)	
Mean governance disclosure			198.584 (.108)
ln(1+Age)	2.977 (.117)	3.17 (.1)	3.405* (.076)
ln(Revenue)	-.574 (.722)	-.44 (.782)	-.339 (.829)
Stock exchange	-4.04 (.383)	-3.598 (.43)	-3.83 (.392)
VC-backed	8.532 (.12)	8.236 (.129)	8.233 (.126)
Underwriter ranking	1.856* (.095)	1.875* (.079)	1.756 (.103)
Constant	-6.873 (.639)	-9.779 (.5)	-15.003 (.304)
Observations	383	385	385
Adj R ²	.084	.081	.088
Year Dummy	YES	YES	YES
Industry Dummy	YES	YES	YES

Similar to the information disclosure section, the underpricing section presents additional results with relative disclosure levels on ESG matters as robustness check. As well as model 5 and 6 in table 7, models 1 and 2 show a significant association of underwriter ranking and underpricing. In model 1, one extra point of underwriter ranking leads to 1.86% more underpricing and in model 2 it leads to 1.88% more underpricing. Furthermore, in model 3 there is a significant association with firm age. 1% older companies are associated with 0.034% more underpricing. In addition, all models in table 8 show evidence for more underpricing in the Retail industry compared to the Consumer Products & Services on average between 23.9% and 24.2%. And year effects in the year 2018 on average between 9.3% and 11.2%, and in 2020 between 27.8% and 29.5%.

The relative metric is a robustness check in this research. In the Retail industry and in the years 2018 and 2020 there is a robust effect on underpricing across almost all models. This suggests

that in the Retail industry and the years 2018 and 2020 there was significantly more underpricing compared to the base case industry and year. Unfortunately, other conclusions are hard to verify as the robustness does not hold for the other hypotheses. However, without robustness check, table 7 presents various contradicting conclusions as discussed earlier.

5.3 Robustness checks

As discussed in the prior chapters of this paper, there are several robustness checks completed to check whether all methodologies were appropriate to use during this research. Homoskedasticity was one of the problems during this research. This was solved by including the robust command in the regressions. Furthermore, the correlation matrix displays many significant correlations for the data and its variables. However, the VIF calculations showed that there is no multicollinearity in this dataset. As described, there are serious concerns on the distribution of the error terms. Several checks show that one of the OLS assumptions does not hold in case the information disclosure is involved. Lastly, the Hausman test show whether there is endogeneity in the dataset. This is the case when the independent variables are correlated with the error terms.

The rvfplots in the appendix show the fitted values together with the standard errors. Count data is often prone to right skewed data, which could influence the methods to apply. The plots show a dispersion effect of the standard error terms in regressing standard OLS. Another indicator for a dispersion effect is that the variance of the variable is larger than the mean as displayed in the table in the appendix. In the OLS assumptions, the variance and mean are more or less the same values. In the mean and variance values of the ESG indicators are displayed. Especially the plots show a dispersion effect of all ESG indicators. However, only for the absolute disclosure rates the variances are larger than the means. That is why, this study has performed a Negative Binominal Regression as a robustness check for this data. Results can be found in the appendix.

6. Conclusion

This paper investigates a firm's disclosure practices in its prospectuses on ESG during initial public offerings. Moreover, it attempts to relate the information disclosure on environment, social and governance matters to underpricing. A range of firm, market and transaction characteristics are included in this research to analyze the relationships. The used variables are firm age, firm size, stock exchange, industry, year of issuance, underwriter ranking and VC involvement. The ESG disclosure levels are gathered via the EDGAR tool of the SEC. Via this tool, all prospectuses of IPOs in the US can be found. With support of a Rstudio package the levels of disclosure could be measured with a word count. This was completed for environmental, social and governance words. The levels of disclosure were used in the regression analyses.

My findings support existing work on information disclosure and underpricing. The data and analyses in this study present evidence that information disclosure is partially influenced by industries, underwriters, firm age and year of issuance. The relation between information disclosure and firm age tends to be positive. Older companies disclose more information on environmental, social and governance matters. Moreover, it confirms the relation between underwriter rank and information disclosure, higher ranked underwriters provide more ESG related information compared to lower rated underwriters. In addition, it confirms the relation with industry and information disclosure. Although, there is no direct link between underwriter ranking and information disclosure, according to Tinic (1988) higher quality underwriters will screen companies better and quality will be higher which could imply better information gathering. And so ESG information. In addition, this study supports work of Ritter (1984) on the relation between more information and older companies. In the regressions, this effect is robust across the four models. It contradicts with Kim & Ritter (1999) findings that younger companies must disclose more non-financial information to compensate for the little financial information that is around. The median firm age in the sample was 5 which implies companies do have financial information around which could explain this effect.

Secondly, the underpricing effect is examined in this study. Unfortunately, no direct relation can be observed between underpricing and information disclosure. The information asymmetry theory presented in the literature review, together with supporting underpricing theories do not hold in this dataset. Surprisingly, firm age as well underwriter ranking tend to have a positive

relation with underpricing. This could be explained by the signalling theory of Allen & Faulhaber (1989) among others. However, the results concerning industry are in line with prior literature. Across models the Retail industry has significant more underpricing compared to others.

Overall, this study provides insights into the relation between ESG disclosure and underpricing. The significant findings this paper presents on ESG disclosure have a great impact on literature regarding information disclosure in initial public offerings. In addition, the methodology of data collection is a well-known, but barely applied methodology in this field of research. Alternative explanations presented in previous literature could explain the results that are presented in the underpricing section. The findings on firm age and underwriter rank are not in line with much of the underpricing literature. However, older firms and companies with high-ranked underwriters could bring a positive signal to the market, according to the signaling theory. Further studies on the relation between underpricing and ESG disclosure are required to verify the theories using different data with various methods.

7. Limitations & Future research

The results of this study are based on associations between various variables. They refer to the general relationship between two random variables while the correlation refers to a linear relationship between the random variables. That is why, the conclusion of a direct linear relation is difficult, but there is an association between the variables. In addition, the exclusion restriction for the instrumental variables is hard to verify. Most likely some of the included instrument variables have a direct effect on underpricing.

With regards to the disclosure rates, there are several methods to measure disclosure rate on ESG. In the included literature, information is often retrieved from official documents such as IPO prospectuses and annual reports. However, disclosure rates of ESG can also be gathered via for example web scraping or special ESG rating databases. In addition, the chosen word lists have an impact on disclosure levels of the companies. Although, the words are the same for every prospectus, the words that are used determine the disclosure levels. This can lead to biases in the levels of disclosure. Moreover, the relative disclosure levels of company A depend on the absolute disclosure levels of the full sample. As this study has two different samples, the relative numbers are dependent on the full sample. However, in the underpricing hypothesis the financials and energy industry are excluded for important reasons. The relative disclosure levels are not renewed after this exclusion since the entire data gathering process should be retaken. Lastly, the text analysis caused a sample limitation due to time-consuming text analysis by the computer.

In the models quite some data is lost due to missing values in the dataset. Furthermore, the Thomson One Reuters data set is used for all the firm, market and transaction characteristics. Other databases could have more detailed, higher quality and complete datasets on data that is used in this study.

Future research should focus on alternative ways to measure ESG disclosure. Furthermore, researchers could focus on other factors in company, market and transaction characteristics that are discussed in previous literature. Such as institutional ownership, manager ownership and misalignment. As well as other countries. A larger sample size would improve for the research as well.

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Appendix

Wordlists

Environment

clean, environmental, epa, sustainability, sustainability climate, warming, biofuels, biofuels, biofuel, green, renewable, solar, stewardship, wind, emission, emissions, ghg, ghgs, greenhouse, atmosphere, emit, agriculture, deforestation, pesticide, pesticides, wetlands, zoning, biodiversity, species, wilderness, wildlife, freshwater, groundwater, water, cleaner, cleanup, coal, contamination, fossil, resource, air, carbon, nitrogen, pollution, superfund, biphenyls, hazardous, householding, pollutants, printing, recycling, toxic, waste, wastes, weee, recycle, ecological, environment, environmentalist, environmentalists, ecosystem, ozone, preservation, preserve, biofuel, co2, dioxide, agricultural, rainforest, rainforests, forest, forests, degradable, biodegradable, plastic, eco-conception, plant, plants, energy, sludge, toxicity, wastewater, celsius, acute risk, adverse weather, biological, biology, coal-based, damage, death, degradation, drought, earth, earthquake, eco, electric, erosion, health, hurricane, hybrid, mining, mine, mortality, sea level, temperature, typhoon, wind, wildfire

Social

citizen, citizens, csr, disabilities, disability, disabled, human, nations, social, veteran, veterans, vulnerable, children, epidemic, health, healthy, ill, illness, pandemic, childbirth, drug, medicaid, medicare, medicine, medicines, hiv, alcohol, drinking, bugs, conformance, defects, fda, inspection, inspections, minerals, standardization, warranty, dignity, discriminate, discriminated, discriminating, discrimination, equality, freedom, humanity, nondiscrimination, sexual, communities, community, expression, marriage, privacy, peace, bargaining, eeo, fairness, fla, harassment, injury, labor, overtime, sick, wage, wages, workplace, bisexual, diversity, ethnic, ethnically, ethnicities, ethnicity, female, females, gay, gays, gender, genders, homosexual, immigration, lesbian, lesbians, lgbt, minorities, minority, race, racial, religion, religious, sex, transgender, woman, women, occupational, safe, safely, safety, ilo, labour, eicc, endowment, endowments, people, philanthropic, philanthropy, socially, societal, society, welfare, charitable, charities, charity, donate, donated, donates, donating, donation, donations, donors, foundation, foundations, gift, gifts, nonprofit, poverty, courses, educate, educated, educates, educating, education, educational, learning, mentoring, scholarships, teach, teacher, teachers, teaching, training, employ, employment, headcount, hire, hired, hires, hiring, staffing, unemployment, abuse, abusive, accident, accountability, activism, age, aging, animal, brand

name, corruption cultural, pay-gap, human capital, healthcare, hospital, inequalities, tax evasion, taxation, tribe, united nations, war, welfare, working conditions, inclusion, ethical

Governance

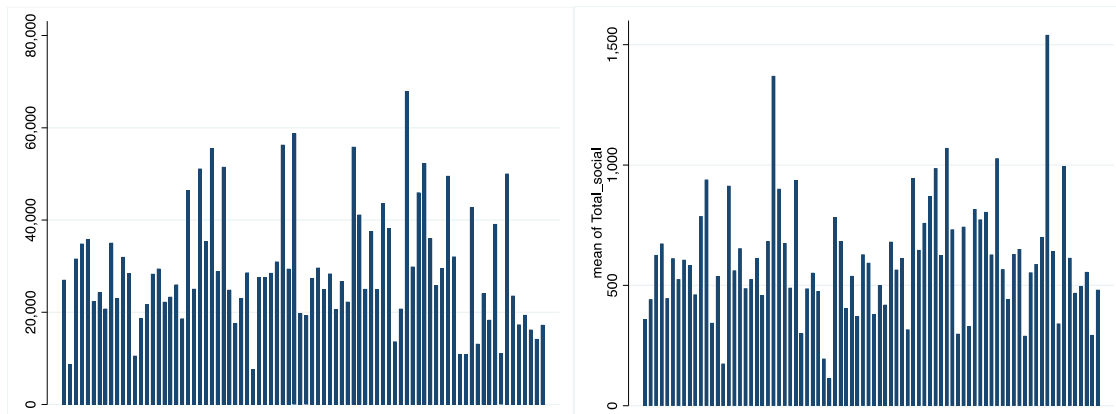
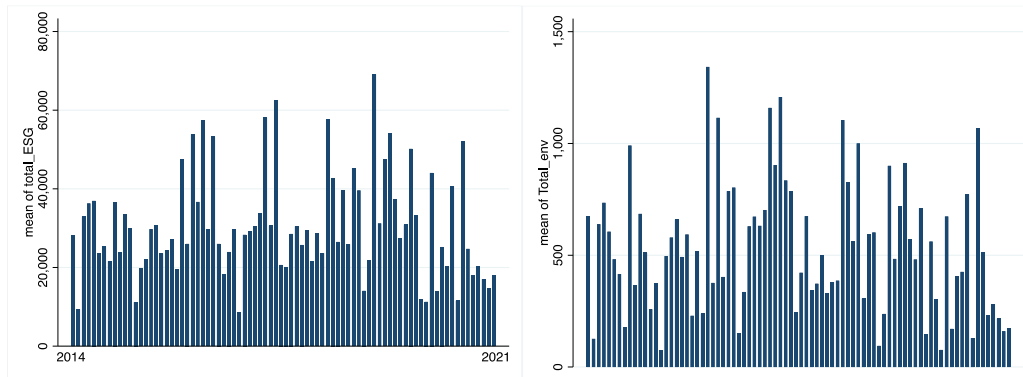
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accountable, accuracy, activism, authority, bankruptcy, board independence, board inefficiency, board membership, board skill sets, board turnover, breach, lawsuit, legal, liquidity risk, litigation, manage risk, management, managing risks, misconduct, mission, money laundering, monitoring, new focus, openness, operational goal, operational performance, operational risk, institutional assessment, institutional framework, institutional investor, institutional profile, institutional quality, shareholder, shareholder initiative, policies

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) total_ESG	1.000													
(2) Total_env	0.833***	1.000												
(3) Total_social	0.712***	0.351***	1.000											
(4) Total_gov	0.829***	0.628***	0.341***	1.000										
(5) mean_tf_idf_env	-	-	-	-	1.000									
(6) mean_tf_idf_so~l	-	-	-	-	0.488***	1.000								
(7) mean_tf_idf_gov	0.006	0.260***	-	-0.003	0.067**	0.106***	1.000							
(8) underpricing	0.200***	0.141***	0.197***	0.135***	-	-0.068**	0.018	1.000						
(9) ln_age	0.315***	0.178***	0.319***	0.250***	-	-	-0.049	0.210**	1.000					
(10) ln_rev	0.075**	0.114***	-	0.163***	0.136***	0.148***	-	*						
(11) Industry_n	0.099***	0.061**	0.116***	0.104***	-0.058**	-0.012	0.014	0.157**	0.238**	0.109***	1.000			
(12) StockExchange_n	-0.007	0.100***	-	0.063**	-0.023	0.010	0.047*	-	-0.051	0.415***	-0.025	1.000		
(13) VC_n	0.198***	0.074**	0.181***	0.009	-0.070**	-0.064**	-0.013	0.249**	0.366**	-	0.148**	-	1.000	
(14) Underwriterra~g	0.198***	0.174***	0.388***	0.141***	-	-	0.029	0.114**	0.004	0.277***	*	0.196***		1.000
					0.093***	0.113***		*		0.312***	-0.022	0.215***	0.167**	*

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

ESG disclosure per category over the sample period: 2014-2020



Summary statistics: N mean sd median by Industry

Industry: Consumer Products and Services

	N	mean	sd	Median
total ESG	37	.35	0.857	.153
Total env	37	715.486	809.401	358
Total social	37	816.351	813.308	558
Total gov	37	35817.405	25317.338	28350

Consumer Staples

total ESG	9	.427	0.929	.148
Total env	9	814.222	854.967	465
Total social	9	637	428.827	555
Total gov	9	46532.222	40093.804	28369

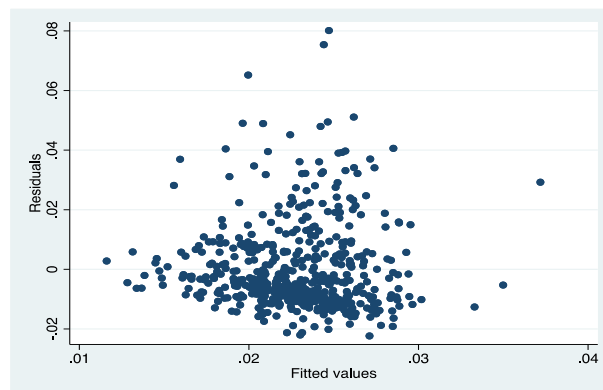
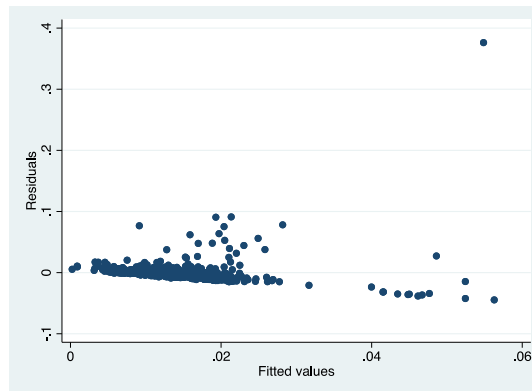
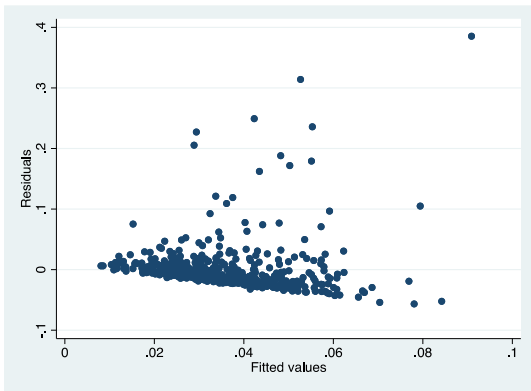
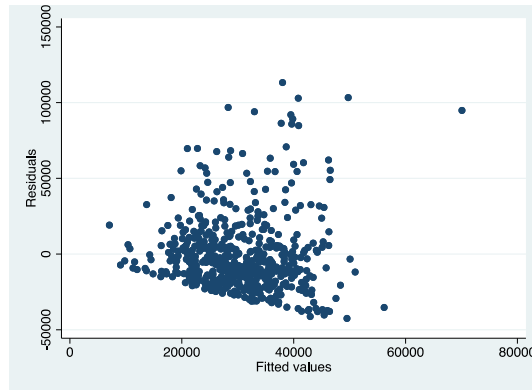
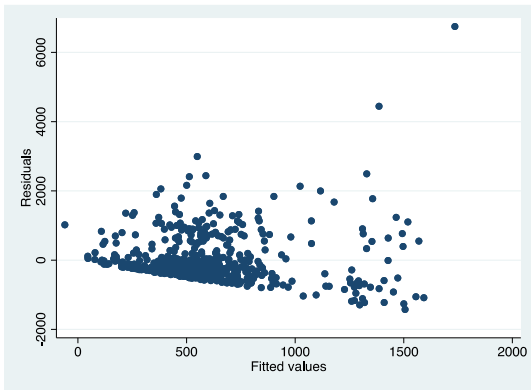
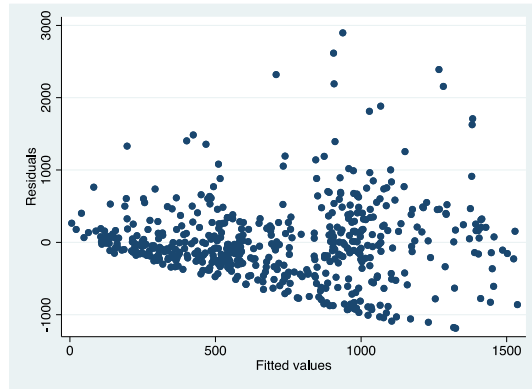
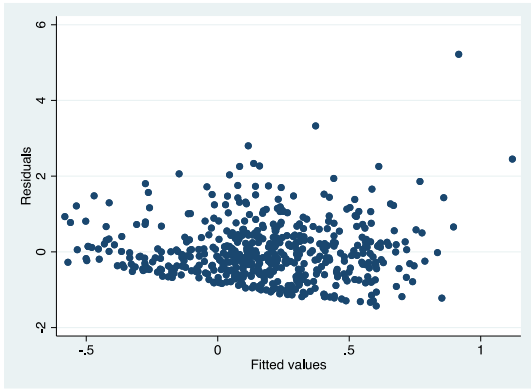
Energy and Power

total ESG	53	.333	1.243	-.051
Total env	53	1342.943	1529.260	819
Total social	53	368.887	545.005	231
Total gov	53	30490.094	30678.117	23318

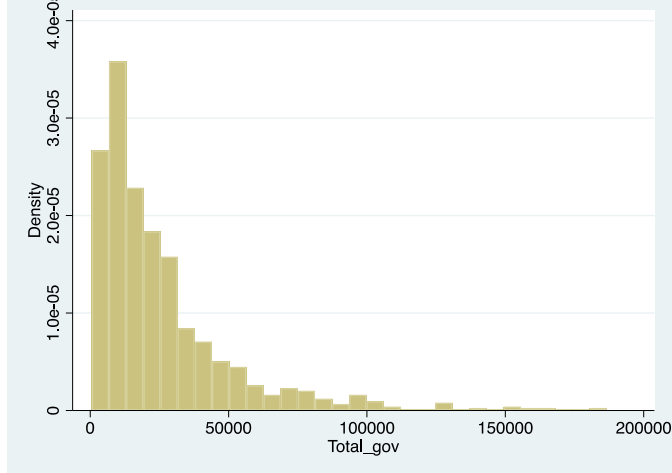
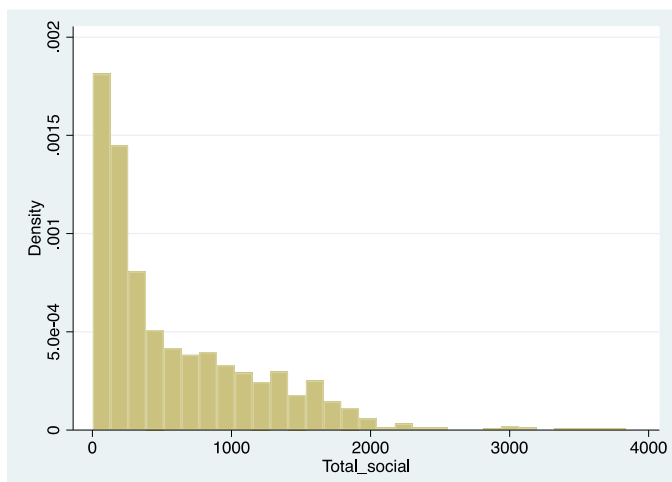
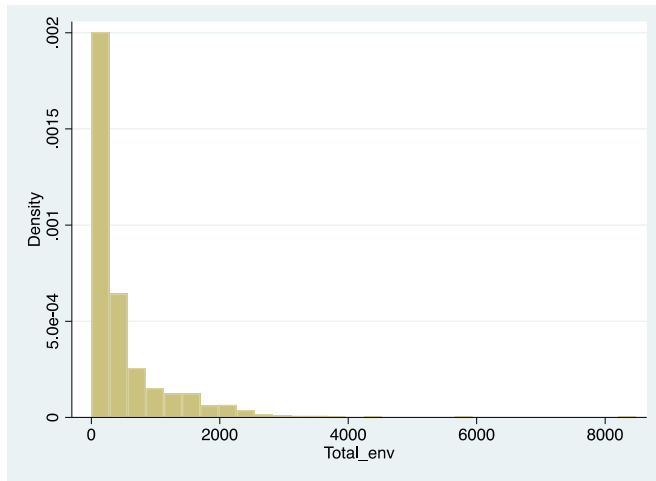
Financials

total ESG	430	-.376	0.624	-.628
Total env	430	230.595	496.691	57
Total social	430	246.86	251.184	155
Total gov	430	21630.949	28093.308	11374

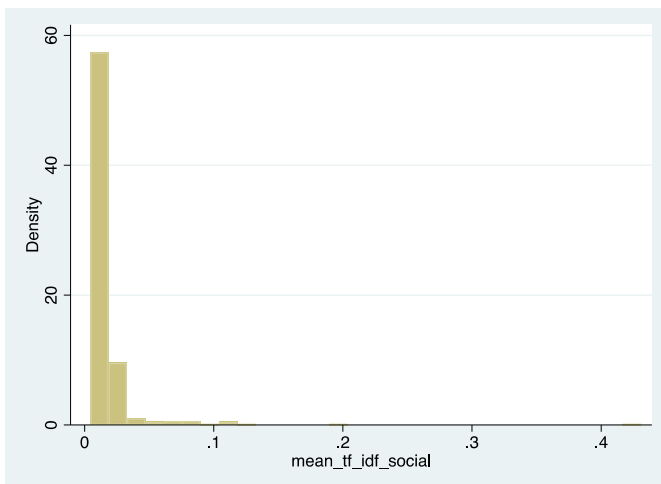
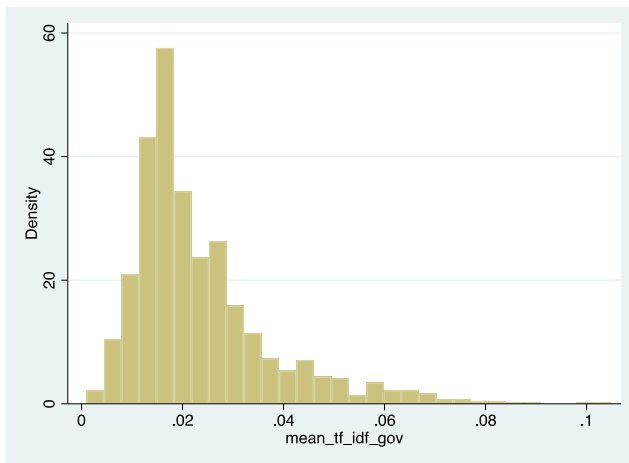
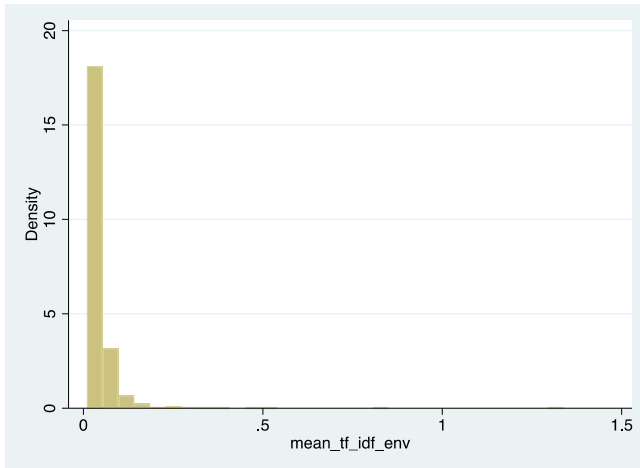
Healthcare				
total ESG	377	.201	0.711	.246
Total env	377	476.257	470.671	379
Total social	377	1028.515	649.914	1076
Total gov	377	23306.851	19654.436	20712
<hr/>				
High Technology				
total ESG	152	.213	0.739	.017
Total env	152	618.27	642.797	368.5
Total social	153	621.536	458.854	495
Total gov	155	37062.174	31302.535	28146
<hr/>				
Industrials				
total ESG	32	.062	0.755	-.159
Total env	32	645.812	671.971	423
Total social	33	585.061	616.725	372
Total gov	33	25592.576	20080.719	21326
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Materials				
total ESG	23	.388	0.964	-.1
Total env	24	1296.667	1173.912	682.5
Total social	24	384.542	353.440	316.5
Total gov	23	33095.739	34675.642	15689
<hr/>				
Media and Entertainment				
total ESG	16	.216	1.177	-.17
Total env	16	566.875	978.984	146
Total social	16	535.688	510.380	342
Total gov	16	43616.812	49241.903	21051
<hr/>				
Real Estate				
total ESG	5	.09	0.699	-.047
Total env	5	371	301.892	344
Total social	5	383.2	276.157	287
Total gov	5	47932.2	38080.551	27228
<hr/>				
Retail				
total ESG	40	.157	0.789	-.119
Total env	40	636.75	715.409	314
Total social	40	569.45	472.993	419
Total gov	40	34476.775	26301.196	32797.5
<hr/>				
Telecommunications				
total ESG	6	-.25	0.405	-.273
Total env	6	211.333	151.281	185
Total social	6	409.333	225.954	335.5
Total gov	6	25157	18468.508	27195
<hr/>				



Absolute disclosure levels



Relative disclosure levels



	(1)	(2)	(3)	(4)
	Total_ESG	Total_Env	Total_Social	Total_gov
ln_age	.138*** (3.423)	.056 (1.027)	.15*** (4.225)	.14*** (3.427)
ln_rev	.031 (1.341)	.03 (1.007)	.033 (1.566)	.032 (1.382)
1.StockExchange_n	.017 (.183)	-.002 (-.017)	-.04 (-.485)	.015 (.16)
1.VC_n	-.141 (-1.637)	.07 (.529)	.11 (1.213)	-.144* (-1.691)
Underwriterrank~g	.052*** (2.845)	.063** (2.395)	.028 (1.307)	.049*** (2.767)
_cons	9.609*** (43.553)	5.484*** (15.913)	5.856*** (22.596)	9.583*** (43.26)
/lnalpha	-.451*** (-8.315)	.202*** (4.352)	-.419*** (-6.209)	-.444*** (-8.238)
Observations	535	536	538	538
Pseudo R ²	.005	.01	.023	.006

p-values are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

Variable	Mean	Variance
Total ESG	0,000653	0,6275582
Total Environmental	480,1931	486219,1
Total Social	599,1048	351970,2
Total Governance	26407,04	743000000
Weighted env	0,0420571	0,0035642
Weighted social	0,0155838	0,0003634
Weighted governance	0,0234865	0,0002