UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Master Degree Project - Accounting and Financial Management

*Graduate School*

*Spring 2021*

# ESG Scores in IPOs: The impact of Board Composition and Ownership Concentration

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# Acknowledgements

First and foremost we would like to express our greatest gratitude to our supervisor Taylan Mavruk, who has given us valuable advice and insights throughout the whole process of writing this thesis and *always* been available when support has been needed. We would also like to express our sincere appreciation to Henrik Lindström and Amanda Dejus for their helpful feedback and interesting discussions throughout the spring. Finally and most importantly, we would like to thank each other for a great collaboration, which brings five years of studies together at School of Business, Economics and Law, at the University of Gothenburg, to an end.

*Gothenburg, June 2021*

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# Abstract

The prevalence of the sustainability agenda and the need for Environmental, Social, and Governance (ESG) issues to be addressed by firms are increasingly characterizing today's business environment. Creating shareholder wealth while also satisfying the wider base of stakeholders, a strategic management approach that ultimately is affected by the firm's governance through the composition of the board and the ownership concentration of a firms' shareholders. While this should be true for all companies in the market in order to stay competitive, it is potentially even more apparent in firms that recently made an IPO. The IPO setting implies that the stakeholder agenda is set under increased pressure due to a broader stakeholder base and increased public visibility through media coverage, analyst following, and society in general. The need for an adequate stakeholder agenda is thus vital for firms in general and IPOs in particular, where the firm's governance should impact this regard and where the effect of the response to this increased stakeholder pressure should be amplified over time.

This thesis takes a quantitative approach to broaden the understanding of how board composition and ownership concentration impacts ESG scores, a proxy for stakeholder management. We use a sample of 710 firms that went public in the US between 2005 and 2017. The hypotheses test whether the impact on ESG scores from board composition and ownership concentration is amplified in the mature stage relative to the early stage of the public life cycle. Board composition is tested through the measures of female board members, independent board members, the board size, and CEO duality. Ownership concentration is tested through the sum of the five largest shareholders, the Herfindahl-Hirschman index, and the largest shareholder's ownership stake.

In line with our expectations, we find that independent board members have a positive impact on ESG scores in the mature stage relative to the early stage of the public life cycle. We also find that CEO duality has an expected negative relative effect in the early stage and the mature stage. However the impact is not amplified in the mature stage of the public life cycle relative to the early stage. On the ownership dimension, we find that ownership concentration has a negative impact on ESG scores in the mature stage relative to the early stage of the public life cycle. However, the marginal effect in the early and mature stage is positive and significant, unexpected, and contrary to previous literature. We speculate that this contrary finding is related to the importance of having large owners from a strategic point of view in the new public environment.

**Keywords:** ESG, ESG score, board composition, ownership concentration, stakeholder management

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# 1. Introduction

## 1.1 Background

The prevailing interest and importance in society on the stakeholder agenda has resulted in an increased need for Environmental, Social, and Governance (ESG) issues to be addressed by researchers. In this study, we attempt to contribute to this field in the setting of Initial Public Offerings (IPOs) and make a profound attempt to understand how ESG scores as a proxy for stakeholder management may be influenced by the composition of the board as well as the ownership concentration of a firm. Consequently, this study investigates the impact of board composition and ownership concentration on ESG scores in IPOs. The focus is on the US market and adopts a quantitative approach.

The sustainability agenda remains one of the most prevailing issues of today's global business environment with an increased impact on financial markets over the past decades and is expected to shape the future business environment largely. Doing well financially as a firm while also doing good for society can generate a win-win situation (Bénabou & Tribole, 2010), a state where the firm manages to satisfy the broader base of stakeholders. Focusing on the broader base of stakeholders to achieve shareholder maximization is probably not an option but rather a requirement to stay competitive as a firm in today's business environment that is characterised by an increased focus on environmental and social considerations. Freeman (1984) expressed the ideas of stakeholder theory and stakeholder management and emphasized the need to satisfy the broader range of interests in a firm, and not only the actual shareholders, as a strategic management approach.

The development of the stakeholder theory has resulted in an increased understanding of non-financial activities such as social and environmental responsibility by firms. Furthermore, the concept of Corporate Social Responsibility (CSR) has been a widely used measure for stakeholder management over the years. Another proxy for stakeholder management that has been increasingly used in more recent studies is ESG through ESG scores which takes a measurable approach and has over the past two decades been a common concept when it comes to the measurement of firms sustainable and societal impact (Kell, 2018). Whether in the form of CSR or ESG, the issues relating to the concepts are similar and commonly used interchangeably (Clark, Feiner & Viehs, 2015), with ESG being the more common used metric recently.

During 2020, a special year due to the global pandemic, the sustainability agenda gained accelerated attention. The companies with sustainable business models that address ESG issues have been widely

rewarded in the stock market, and an increased inflow of capital to these types of companies has been seen (Financial Times, 2020). The accelerating considerations of ESG activities can be seen in Blackrock, one of the world's largest investment management firms, and more specifically their new strategic direction expressed in 2020´s CEO letter. The CEO, Larry Fink, states that sustainability should be their standard way of investing and further highlights that this development indicates a starting point towards a fundamental reshape of finance (Fink, 2020). In order to anticipate how the future agenda for investments in ESG could look like, Larry Fink predicts that there will be a distinct reallocation of capital towards sustainable business models (Fink, 2020).

The spike in ESG capital allocation seen in 2020 is agreed by JP Morgan that concluded that there exists momentum for ESG investing, and it is fast-growing with 45% of global assets under management following ESG principles (Hecker & Dubourg, 2020). Recently, it was reported that in 2020 ESG investments reached a new record level. The bond volumes increased to 489 billion US dollars, being a record high volume, and firms with higher ESG scores have shown better returns for all months except April (Umunna, 2020). The immensely increased attention of the ESG agenda within the financial sector through a record amount of capital inflow makes the area a very relevant and interesting one to study further.

## 1.2 Problem Motivation and Research Question

The complexity and pressure from a firm's stakeholders can arguably be affected by many factors but not limited to the firm's size, the complexity of the business, the firm's age, or whether a firm is a public corporation. An IPO marks the first step as a public corporation and is reasonably also a point where the evolving stakeholder audience increases and the pressure on management to satisfy this broader interests base. The characteristics of an IPO imply a higher degree of information asymmetry as the firm has not been quoted before (Arenas-Parra & Álvarez-Otero, 2020), highlighting the importance of corporate transparency to satisfy the increased interests from stakeholders. After all, going public does result in a more extensive set of stakeholders partly because of an increased public awareness (Bancel & Mitto, 2009) which implies more visibility through media coverage, analyst following, and society in general (Certo, Holcomb & Holmes Jr, 2009; McHugh & Perrault, 2018). That is, firms performing an IPO will have to cope with an increasing stakeholder base and its different set of interests (Foley & Greenwood, 2010; Demarzo & Urošević, 2006). Thus, an IPO firm constitutes a great example where the stakeholder agenda is put under pressure and increases as the firm becomes mature and where optimal stakeholder management should be important in response to this increased stakeholder pressure. An inadequate stakeholder agenda could lead to monetary and reputational losses (Harjoto, Laksmana & Lee, 2015). Enabling and improving the stakeholder agenda can thus be seen as a strategic matter, in

line with the ideas by Freeman (1984) and consequently a concern for the shareholders of the firm and the board of directors on their behalf.

The impact on stakeholder management from board composition and ownership concentration is further a field of research that has gained increased attention over the years and where both CSR (e.g., Barnea & Rubin, 2010; Harjoto et al., 2015; Jizi, Salama, Dixon & Stratling, 2014; Arenas-Parra & Álvarez-Otero, 2020) and ESG (e.g., Birindelli, Dell´Atti, Iannuzzi & Savioli, 2018; Velte, 2016) has been used as an outcome variable for stakeholder management. However, previous literature has mainly focused on the impact from board composition and ownership concentration separately (e.g., Cucari, Esposito De Falco & Orlando, 2018; Birindelli et al., 2018), or in combination in specific countries such as Spain (Arenas-Parra & Álvarez-Otero, 2020) and Italy (Bollazzi & Risalvato, 2018) whereas we will investigate them in an IPO setting over time, on the US market. This particular setting can aid in understanding how board composition and ownership concentration influence and can facilitate a better ESG score over time after an IPO when a firm is expected to be under increased stakeholder management pressure. We expect the pressure from different stakeholders to continue to increase the time after an IPO, reflecting the natural development of the life cycle of a public firm. However, as the IPO firms become mature, it seems most reasonable that they will be better in responding to the interests from the stakeholders where board composition and ownership concentration may facilitate improved stakeholder management over time.

Although there seems to be a consensus regarding the ESG agenda and the positive effect on firm performance and firm value (Clark et al., 2015), different stakeholders may have varying perceptions about engagements in ESG activities, and there might be a conflict on whether it is value-creating or not. In line with the ideas of Jensen and Meckling (1976) and the agency problem, managers have shown to be rewarded for the firm's ultimate goal, financial performance (Benson & Davidson, 2010), and not for good stakeholder management. This could have implications on the actions performed by the management of a firm and, more specifically, their interest for ESG investments. For example, Barnea and Rubin (2010) suggest that CEOs may invest in CSR to gain personal benefits such as improved reputation regardless of the actual impacts. How to engage in ESG practices, in other words, how to respond to increased stakeholder pressure, is reasonably quite complex and might include conflict of interests between the management, the shareholders, and the board of directors on behalf of the shareholders, highlighting the need for further research within this field.

The prevailing interest from investors to seek ESG exposure (Hecker & Dubourg, 2020; Umunna, 2020) and the large amount of IPOs in recent time where 2020 marked a level in parity to the record year of 1999 (Ritter, 2021) highlights the relevance of the setting of this study. Consequently, our purpose is to elaborate on the impact of board composition on stakeholder management, proxied as ESG scores, after

an IPO over time, and the impact of ownership concentration on stakeholder management, proxied as ESG scores, after an IPO over time. The study further aims to answer the following research question:

*How does board composition and ownership concentration impact stakeholder management in IPOs over time?*

To enable answering this research question, we examine several board composition measures and ownership concentration measures. Specifically, we examine the impact of female board members, independent board members, CEO duality, and board size on stakeholder management proxied as ESG score. We also examine the impact on stakeholder management, proxied as ESG scores, through the ownership stake of the five largest owners, the Herfindahl-Hirschman index, and the ownership stake of the largest shareholder. In order to interpret the impact over time, we introduce a dummy variable representing the mature stage of the public life cycle. It allows us to interpret the relative effect of the mature stage compared to the early stage of the public life cycle since IPO. We use ESG scores retrieved from Refinitiv Eikon in line with previous studies (Velte, 2016; Arayssi, Jizi & Tabaja, 2020; Birindelli et al., 2018), which includes over 450 ESG metrics (Refinitiv, 2021).

Our study contributes to the ESG literature primarily by focusing exclusively on ESG scores in an IPO setting and the impact of board composition and ownership concentration over time, which we facilitate by comparing the mature stage of a public firm's life cycle with the early stage of the public life cycle. We also contribute to the IPO literature where previous studies on ESG performance in IPO's seems to be very limited. The primary interest of the study can be found in private firms with IPO intentions as they can interpret corporate governance mechanisms behind good ESG scores when going public. The study can also be of interest for recently listed firms seeking to improve their ESG scores as it may function as guidance in what corporate governance actions that are favorable to enable enhanced stakeholder management and, thus, better ESG scores.

The remainder of this thesis is structured as follows; Section two presents the literature review and the hypothesis development. Section three presents the data and the study's methodology, including for example sample selection, research design, and the regression model. The fourth section presents the regression results. The fifth section includes an analysis and discussion of the results. Finally, the sixth section includes the conclusion.

# 2. Literature Review & Hypothesis Development

## 2.1 Board Composition

The composition of the board is an essential factor in how a firm is governed. Fama and Jensen (1983) describe the role of a board as a critical part in solving conflicts between decision-makers resulting from the separation of ownership and control between shareholders and the management. The role of a board is, among many things, to compensate senior management, be involved in a firm's long-term strategy while also having the authority to hire and fire the CEO (Baysinger & Butler, 1985). As a result of being a critical factor in a firm, the composition of the board and what is considered an optimal board structure have received great attention. Baysinger and Butler (1985) highlight that, with considerations to firm individual circumstances, a mixture of types of directors in a board tends to be the most optimal composition. For example, the authors highlight the mixture of independent and dependent board members as a key factor in creating an optimal board composition. This view is in line with several other corporate governance studies (e.g., Baysinger & Hoskisson, 1990; Mace, 1971) that also emphasizes diversity in the board, and more specifically, independent board members, as a key factor in a board's ability to facilitate the corporate strategy.

Another study shows that firms seek legitimacy, more specifically stakeholder representation in the board, to respond to their needs (Luoma & Goodstein, 1999). This implies a response to stakeholders' recommendation of an appropriate board structure enhancing stakeholder management. Further, the authors emphasize that external factors such as legal environment, industry regulation and firms' individual characteristics substantially affect whether a specific board composition is optimal for different firms.

The board structure is continuously weighted towards the need for controlling different agency costs which Bathala and Rao (1995) highlights. The authors mean that the benefits of a more optimal board, such as more diverse knowledge and experience, are weighted towards the need for handling agency costs with the aim of effective stakeholder management (Bathala & Rao, 1995). Consequently, there seems to be no unified definition of an optimal board composition nor what a diverse board implies, however factors that have been studied in board composition literature, among many but not limited to, include gender diversity (Wagana & Nzulwa, 2016), independent board members (Baysinger & Hoskisson, 1990), CEO duality (Baliga, Moyer & Rao, 1996) and board size (Raheja, 2005).

### 2.1.1 Female Board Members

The interest of female board members by previous literature derives from, among many things, the historical low degree of females on the boards (Burgess & Tharenou, 2002). A vast amount of previous literature tests the influence of female representation on firms CSR activities. Bear, Rahman, and Post (2010) study the impact of females on the board on CSR activities by conducting a survey on the US market in 2009, including 689 companies. The authors show that females on the board support a positive relationship with CSR ratings while also contributing to more democratized decision-making styles. Additionally, female representation is said to lower communication barriers which promote enhanced CSR activities (Bear et al., 2010).

Gupta, Lam, Sami and Zhou (2015) find that gender-diverse boards support CSR performance when studying listed firms in the US between 2003 and 2012. The authors argue that firms with diverse boards are more sensitive to the broader base of stakeholders rather than only the shareholders and can facilitate initiatives such as environmental and social activities that benefit societies in a better way. Velte (2016) finds that females on the board positively influence ESG scores of firms listed on the German and Austrian financial markets between 2010 and 2014. The author means that the presence of female representation supports a changed attitude that is more inclusive towards the interests of the broader stakeholder base. Thus, females on the board imply an improved board composition in terms of understanding the needs of the stakeholders, which facilitates a basis for improved stakeholder management (Velte, 2016). Similar results of a positive influence of females on the board on corporate social and environmental performance have been found in the Chinese market (McGuinness, Vieto & Wang, 2017), in the US (Hafsi & Turgut, 2013; Villiers, Naiker & Van Staden, 2011; Harjoto et al., 2015), in Turkey (Kilic, Kuzey & Uyar, 2015), in Jordan (Arayssi et al., 2020) and in global samples (Naciti, 2019; García-Sánchez & Martínez-Ferrero, 2018).

An alternative approach to the impact that females on the board exhibit is presented by Birindelli et al. (2018) that finds a nonlinear relationship. The authors study a European and US sample of the banking industry between 2011 and 2016 and find that females on the board and ESG performance exhibit an inverted u-curve to a certain degree. This indicates that gender-balanced boards will experience a positive influence on ESG performance.

There is plenty of evidence in previous literature suggesting that female representation on boards positively influences ESG activities, and we expect that the same relationship exists in an IPO setting. Moreover, based on the increased stakeholder pressure that an IPO firm is exposed to (Foley & Greenwood, 2010; Demarzo & Urošević, 2006), we expect that the positive influence from female board

members should increase over time once the firm matures, where female board members are expected to facilitate the response to this increased pressure. Thus, we hypothesis the following:

***H1a: Female board members have a positive impact on ESG scores in the mature stage of the public life cycle relative to the early stage of the public life cycle.***

### 2.1.2 Independent Board Members

The definition of an independent board member varies. Several papers define independence as a person with no current or former employment and with no previous relationship with the management and the firm in general (Adams & Ferreira, 2009; Villiers et al., 2011). The impact of independent board members on social and environmental performance variables is tested in various papers, and results show in general a positive influence.

Boards with independent directors have proved to be more efficient in their decision-making (Holtz & Sarlo Neto, 2014) while also, to a higher degree, encouraging CSR disclosures (Arenas-Parra & Álvarez-Otero, 2020). Reeb and Zhao (2013) study listed firms in the US between 2003 and 2017 and find that independent board members positively influence CSR and financial disclosure, leading to improved corporate reputations. Furthermore, Arayssi et al. (2020) find that firms with a higher degree of independent board members function as a catalyst for improved ESG activities and facilitate a good relationship between a firm's financial targets and social responsibility. Post, Rahman, and McQuillen (2015) study listed firms in the US in 2009 and find that independent board members positively impact corporate environmental performance. The authors also find that the appearance of independent board members influence other strategic actions that aim to improve environmental performance, for example, sustainability alliances.

Zhang, Zhu, and Ding (2013) study more than 500 companies in the US between 2007 and 2008 across 64 industries and find a positive relationship between independent board members and a firm's CSR performance. Independent board members are said to be more sensitive towards satisfying the stakeholder's interests, contributing to better stakeholder management. Deschênes, Rojas, Boubacar, Prud'homme and Ouedraogo (2015) find similar results with a positive relationship when investigating the relationship between CSR ratings and board composition of listed firms in Canada between 2004 and 2008. The authors suggest that independent board members have a crucial role in broadening the perspectives of a firm's stakeholder management to not only focus on the shareholder's interests. Thus, independent board members can facilitate a combination of both financial and non-financial activities such as social and environmental factors (Deschênes et al., 2015), in line with other studies (e.g., Khan, Muttakin & Siddiqui, 2013; Kilic et al., 2015).

Despite that most literature finds a positive relationship, a scarce amount of literature suggests a negative relationship. Naciti (2019) investigate firms in the US between 2013 and 2016 and find a negative relationship between a higher degree of independent board members and sustainability performance. According to the author, the motivation could be linked to reputational risks affecting the behavior of the board members when engaging in CSR disclosures. García-Sánchez and Martínez-Ferrero (2018) use a global sample of firms between 2006 and 2014 and show that independent board members only encourage voluntary CSR disclosure if a company's performance in terms of socially responsible performance is positive. The authors suggest that this phenomenon is explained by fear of reputational risk, in line with Naciti (2019), and is an action to protect the firm's shareholders' interest by not disclosing information that can harm the firm value. Similar results have been found in a US study between 1997 and 2005 (Walls, Berrone & Phan, 2012).

Except for a few studies that indicate a negative impact, the majority of previous literature suggests that there exists a positive influence of independent board members on ESG activities which we also expect to find in our IPO setting. In line with the first hypothesis H1a, we expect that the independent board members should facilitate the necessary response to the increased stakeholder pressure that an IPO firm is exposed to and that the influence from independent board members should increase over time after an IPO. Hence, we hypothesize the following:

***H1b: Independent board members have a positive impact on ESG scores in the mature stage of the public life cycle relative to the early stage of the public life cycle.***

### 2.1.3 Board Size

The size of the board could have many implications and constitutes a trade-off between the benefits of broader perspectives retrieved from a larger board and monitoring costs (Boone, Field, Karpoff & Raheja, 2007). Dalton, Daily, Johnson and Ellstrand (1999) conducts a study in the '90s and finds that larger boards provide better advice as the size means that the board possesses a broader base of expertise and knowledge. The authors highlight size as a factor that increases the likelihood of diversity in knowledge and experience in a board. In addition, if a large board lacks competence within a field, such as environmental performance, they are more likely to include external experts than smaller boards (Dalton et al., 1999).

A vast amount of previous literature highlights the positive aspects of large boards and their influence on environmental and social performance. Villiers et al. (2011) conduct a study of US-listed firms between 2003 and 2004 and show that large boards positively support environmental performance, deriving from the many members expertise and diversity needed for enhanced environmental performance. In addition, a large board is not only better in influencing a firm's direction towards the

sustainability agenda and the strategic expertise required, it also has better access to a rich network of experts that can improve a firm's environmental performance (Villiers et al., 2011). Jizi et al. (2014) find that firms with larger boards show a positive relationship with CSR disclosures as board size functions as an internal governance mechanism promoting the interests of all stakeholders. Similar results have been found in a study on a US and European sample (Birindelli et al., 2018).

Jizi (2017) shows in a study of listed firms in the UK between 2007 and 2012 that large boards are positively encouraging firms' CSR disclosures to meet social needs. The diversity in terms of background and experience and better workload allocation are factors supporting CSR disclosures (Jizi, 2017). Kaymak and Bektas (2017) study how different board composition factors influence multinational companies' CSR practices and find a positive relationship between board size and CSR activities. The authors emphasize that a large board implies a more diverse group of people with a greater ability to satisfy more complex sets of stakeholders than a smaller board. Furthermore, a large board facilitates transparency in their communication to satisfy the demands from a broad stakeholder base in multinational companies (Kaymak & Bektas, 2017).

In line with previous literature, we expect to find that larger board size positively impacts ESG scores in an IPO setting. Following the tendency of a more diverse stakeholder base when a firm goes public (Demarzo & Urošević, 2006; Foley & Greenwood, 2010; Urošević, 2001) and further the emphasized increased stakeholder pressure over time with more interests to satisfy, we expect that the positive influence from board size should increase over time once the firm matures. That is, we expect a large board to better facilitate a more diverse knowledge and expertise in order to better respond to the increasing stakeholder pressure. Hence we hypothesize the following:

***H1c: Board size has a positive impact on ESG scores in the mature stage of the public life cycle relative to the early stage of the public life cycle.***

### 2.1.4 CEO Duality

The presence of CEO duality, that the CEO is also the chairman of the board in a firm, is described in previous corporate governance studies to generate several adverse outcomes. Boyd (1994) suggests in a study on the US market that CEO duality leads to a decreased independence of the board and increased information asymmetry between the board and the CEO. Finkelstein and D'Avenis (1994) study a global sample from the ’80s and suggest that CEO duality may lead to conflicts of interests. The authors show that the risk for CEO entrenchment increases when a CEO has strong informal power and when a firm performs financially well, illustrating the negative aspects with CEO duality being present. Further, CEO duality could imply that the CEO rather advance their own agendas and maximize short-term profit instead of making relevant long-term investments (Villiers et al., 2011).

There is a vast amount of previous literature that investigates the impact of CEO duality on CSR. Sundarasen, Je-Yen & Rajangam, (2016) study listed firms in Malaysia between 2011 and 2012 and suggest that separation of the chairman and CEO role can enhance monitoring quality which should positively affect transparency and the quality of CSR initiatives. Arayssi et al. (2020) show that firms with CEO duality give lower priority to implement the social agenda, suggesting that CEO duality has a declining effect on environmental and social initiatives. Gul and Leung (2004) find that firms with presence of CEO duality are associated with lower levels of voluntary disclosure when conducting a study on a sample of listed firms in Hong Kong in 1996. Similar results of a negative impact of CEO duality on CSR disclosures have been found in other studies (e.g., Giannarakis, 2013; Alabdullah, Ahmed, and Muneerali, 2019).

Muttakin and Subramaniam (2015) study 100 listed companies in India between 2007 and 2011 and show that CEO duality has a negative relationship with CSR disclosures and information disclosure regarding employees health and wellbeing, which constitute fundamental aspects of the ESG score. In a US study with a sample from 2001, Webb (2004) compares almost 400 socially responsible classified companies with an index of firms without social responsibility classification. The author finds that socially responsible firms are more likely to have a separation between the CEO role and the chairman of the board. The socially responsible companies have a higher average corporate governance score partly deriving from their focus on stakeholder maximization strategies rather than shareholder wealth. Emphasis is also placed on board diversity, where the absence of CEO duality is seen as an essential factor, enhancing broader perspectives in the board and facilitating better stakeholder management (Webb, 2004).

While a large amount of literature finds a negative relationship between CEO duality and firms' social and environmental performance, Jizi et al. (2014) find a positive relation between CEO duality and CSR disclosure in a study in the US between 2009 and 2011. The authors highlight that CEOs' willingness to disclose CSR activities potentially derives from fear for reputational concerns but also to gain private benefits, resulting in an agency problem. Despite this contrary finding, we expect that CEO duality has a negative impact on ESG scores in IPOs, in line with the vast majority of previous studies. A central reason for this belief is based on boards' reduced ability to influence management and their stakeholder initiatives when CEO duality is present and when the firm is exposed to increased stakeholder pressure. We also expect this negative influence to be amplified when the firm ages over time. Hence we hypothesize the following:

***H1d: The presence of CEO duality has a negative impact on ESG scores in the mature stage of the public life cycle relative to the early stage of the public life cycle.***

## 2.2 Ownership Concentration

The idea of stakeholder management in today's business environment is well established, but varying views on this may still exist among shareholders, and different ownership structures can potentially be better in influencing stakeholder management. However, previous literature investigating the relationship between ownership concentration and stakeholder management has in general shown a negative relation. Ducassy and Montandrau (2015) study listed firms in France in 2011 and test the relationship between ownership concentration and firm's CSR practices. The authors show that ownership concentration has a negative impact on CSR practices. That is, a more dispersed ownership promotes CSR practices that harmonize the relationship between a firm's stakeholders. Ducassy and Montandrau (2015) further suggest that the most influential shareholders with a substantial amount of voting rights appear to be unwilling to spend money on CSR activities that do not generate a direct return on investment. The authors explain this pattern by the fact that the largest shareholders bear the costs while receiving shared benefits with all other shareholders. In line with Samuelson (1954), and the theory of public expenditures, large owners seem unlikely to provide public goods privately, more specifically engaging in CSR activities in this case.

Dam and Scholtens (2013) find similar results in their study, including 700 European firms in 2005, and show that ownership concentration negatively affects CSR performance. In line with the findings of Ducassy & Montandrau (2015), the explanation is that larger shareholders account for the costs while sharing the benefits with all shareholders. For larger shareholders with substantial power over a firm, CSR investments are associated with a relatively high price when considering the potential trade-off between financial performance and non-financial activities (Dam & Scholtens, 2013). Furthermore, Khan et al. (2013) study firms in Bangladesh in the 00s and show that large owners are less willing to engage in CSR activities and disclose CSR information to the market. Qa'dan and Suwaidan (2019) find similar results.

Similarly, Barnea and Rubin (2010) conduct a US study including approximately 3000 listed companies in the 00s and find that the ownership stake of a firm's majority owners and CSR ratings have a negative relationship. The authors show that firms with influential shareholders holding a substantial amount of voting rights negatively affect the CSR rating compared to firms with more dispersed ownership concentration. The motivation is, among many others, that the majority owners may seek to improve their personal reputation by engaging in CSR activities leading to irrational investments that do not necessarily improve the CSR rating (Barnea & Rubin, 2010).

Another dimension of ownership concentration is related to the ownership stake by the largest shareholder. Brammer and Pavelin (2008) investigate factors that influence the quality of firms CSR

disclosure in the UK in the 00s and show that the largest shareholder is reluctant to promote CSR disclosures while also being less likely to introduce CSR policies. Furthermore, Desender and Erupe (2015) suggest that the largest shareholder has both the power and incentives to influence a firm's activities, meaning that investments in non-financial events such as ESG investments without a clear financial return on investment, might be rationalized away. Thus, this explains why the authors find that the influence of the largest shareholder in a firm has a negative impact on corporate environmental performance.

Moreover, ownership concentration is a relevant factor in an IPO setting since the listing of a firm has been shown to influence the ownership structure. Going public implies, among many things, an opportunity for pre-IPO owners to realize some of their initial investments and outside equity ownership to increase (Jensen & Meckling, 1976). This proves to be a value-creating activity altering management incentives to maximize firm value (Jensen & Meckling, 1976). In line with this view, several studies show that ownership concentration tends to decrease after an IPO (Demarzo & Urošević, 2006; Foley & Greenwood, 2010; Urošević, 2001) following the logics of risk diversification and an efficient risk-sharing allocation. Foley and Greenwood (2010) study a global sample of firms between 1995 and 2006 and investigate how ownership concentration changes after an IPO. The authors find that firms in countries with strong investor protection (e.g., the US) experience a decreasing ownership concentration as investors tend to get diluted when firms show high growth and thereby issue new stocks. An IPO setting where decreased ownership concentration is likely may also influence a firm's stakeholder management positively. After all, a more dispersed ownership concentration could imply that there is a broader set of shareholders that influences the strategic direction of the company and further influences the stakeholder management.

Further, in an IPO setting, it is reasonable to believe that the ownership structure becomes suboptimal in the absence of large owners when ownership concentration tends to decrease (Demarzo & Urošević, 2006; Foley & Greenwood, 2010; Urošević, 2001). When a firm goes public, the information asymmetry is reasonably high since the firm has not been quoted before (Arenas-Parra & Álvarez-Otero, 2020), whereby majority owners, by holding a substantial ownership stake, could give confidence to other investors. Majority shareholders may act as a link between the shareholders and the firm, reducing the uncertainty an IPO setting constitutes and act as a strong force when it comes to strategic questions as well as reducing conflicts of interest between the shareholders and the management, in line with the ideas of Jensen and Meckling (1976). Related to this, Crisóstomo and Freire (2015) find a positive relationship between ownership concentration and CSR policies, and more specifically, positive influence from high ownership by the largest shareholder in a study of listed firms in Brazil between 1997 and 2008. Huafang and Jianguo (2007) study listed firms in China in 2002 and find similar results as they suggest that large blockholders are positively willing to voluntarily disclose non-financial information, which is an essential part of the assessments of ESG scores (Refintiv, 2021).

Despite the positive influence of concentrated ownership in an IPO setting as previously discussed, the majority of prior literature has shown that IPOs are associated with a decreasing ownership concentration (e.g., Demarzo & Urošević, 2006; Foley & Greenwood, 2010; Urošević, 2001) and that ownership concentration has a negative effect on CSR (e.g., Ducassy & Montandrau, 2015; Dam & Scholtens, 2013; Qa'dan & Suwaidan, 2019). Testing the impact of ownership concentration on ESG scores in an IPO setting over time is therefore relevant. Considering a more diverse ownership base after an IPO and increased stakeholder pressure, we expect that ownership concentration negatively impacts firms' ESG performance. Furthermore, the negative influence of ownership concentration is assumed to increase over time once the firm matures as this structure would not be optimal in facilitating a strategic direction that satisfies all stakeholders' different interests. In other words, we expect to find a negative relationship between ownership concentration and ESG scores in an IPO setting, and the impact is expected to be amplified over time. Hence, we hypothesize the following:

***H2: Ownership concentration has a negative impact on ESG scores in the mature stage of the public life cycle relative to the early stage of the public life cycle.***

# 3. Data & Methodology

## 3.1 Sample Selection

The sample of the study is an unbalanced panel data of US-listed firms that made an IPO between the years 2005 and 2017. When screening our sample, we use Refinitiv Eikon, which is in line with previous studies where ESG is used as the main dependent variable (e.g., Arayssi et al., 2020; Drempetic, Klein and Zwergel, 2019). The database provides a weighted-average ESG score that measures the firm's performance in terms of ESG activities from a large proportion of environmental, social, and governance criterias (Refinitiv, 2021). The rationale behind the time period of the study is to maximize the sample of firms while we also seek to have the longest possible time period.

The time period is bound to data availability of ESG-scores and our criteria of at least three years consecutive ESG-score, a criteria needed to secure a panel dataset with multiple observations across firms. The reason why we focus exclusively on US-listed firms is twofold. First, focusing exclusively on a single country sample implies that the institutional and legal aspects are similar, providing better comparability by minimizing the potential impact from differences in laws and regulations. Secondly, using US-listed firms is relevant considering the data availability where US firms represent the majority of the global sample of firms with ESG scores during the chosen time period.

### 3.1.1 Screening Procedure

The initial screening is done in Refinitiv Eikon where we screen for US-listed firms with IPO dates between the time period 2005 and 2017. We select primary listings and that they should have at least three consecutive years of ESG-score data. This provides us with a set of 947 companies. Applying the same criteria except the exchange criteria would result in a global sample of 2056 companies. A common issue with IPO date as a screening criteria is that there might be companies included in the sample that have either been listed on the stock market as a result of a merger or a spin-off or equivalent. Such companies are not ideally suitable for this study since they do not characterize a typical IPO firm. However, it is difficult to exclude them. To avoid this sample bias, we use the screening criteria *First trade date* in Refinitiv Eikon, which according to the database, is supposed to be the same date as the initial public offering date. We remove the companies where this condition does not hold, companies that are either a merger, a spin-off, or equivalent. The second screening stage results in a sample of 825 companies.

The additional data needed for our hypotheses are board composition data as well as ownership data. The board composition data is complete and available for all companies with no missing values. The ownership data however has more flaws either by being incomplete or of low quality, such as having consistently missing values for the 25 largest shareholders in the firm. We drop these companies since imputing the mean for the missing ownership data does not seem to be an adequate solution due to a large amount of missing data.

Finally, in line with previous studies on IPOs (Arikan & Stulz, 2016; Jain & Tabak, 2008; Ritter, 2021), we exclude Real Estate Investment Trusts (REITs) since the characteristics and the nature of these instruments, for example, that they pay a minimum 90% of taxable income in dividends and have special tax regulations, differ significantly from a typical IPO firm. The final sample consists of 710 firms and 2813 year observations. Appendix 1 moreover shows the screening procedure.

### 3.1.2 Sample Composition

The composition of the sample in terms of observations with the index *Age since IPO* can be seen in Panel A in Table 3.1. The distribution is relatively balanced in terms of observations per year except for years 13-15. The reason why we have few observations here is a natural result of our screening process on IPO year, resulting in an unbalanced panel dataset. Panels B and C in Table 3.1 further reveals the sample composition in terms of sector, both by the number of firm observations and the number of firms. Looking at the percentage in terms of observations and in terms of firms, these are more or less the same for all sectors except healthcare.

**Table 3.1**

Sample Composition

| Panel A: Observations by Age since IPO | | | Panel B: Observations by Sector | | | Panel C: Firms by Sector | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 170 | 6% | Communication Services | 189 | 7% | Communication Services | 46 | 6% |
| 2 | 296 | 11% | Consumer Discretionary | 407 | 14% | Consumer Discretionary | 97 | 14% |
| 3 | 344 | 12% | Consumer Staples | 72 | 3% | Consumer Staples | 17 | 2% |
| 4 | 363 | 13% | Energy | 139 | 5% | Energy | 38 | 5% |
| 5 | 327 | 12% | Financials | 478 | 17% | Financials | 117 | 16% |
| 6 | 252 | 9% | Health Care | 451 | 16% | Health Care | 150 | 21% |
| 7 | 182 | 6% | Industrials | 380 | 14% | Industrials | 87 | 12% |
| 8 | 162 | 6% | Information Technology | 504 | 18% | Information Technology | 112 | 16% |
| 9 | 148 | 5% | Materials | 120 | 4% | Materials | 28 | 4% |
| 10 | 129 | 5% | Real Estate | 37 | 1% | Real Estate | 9 | 1% |
| 11 | 146 | 5% | Utilities | 36 | 1% | Utilities | 9 | 1% |
| 12 | 140 | 5% | | | | | | |
| 13 | 97 | 3% | | | | | | |
| 14 | 51 | 2% | | | | | | |
| 15 | 6 | 0% | | | | | | |
| **Total** | **2813** | | | **2813** | | | **710** | |

*Panel A and B shows the sample composition by observations. Panel C shows the number of firms in each sector of the sample. The percentage indicates the share of the total in each respective panel. The sample is reduced by one observation in line with the model where all hypotheses variables are lagged.*

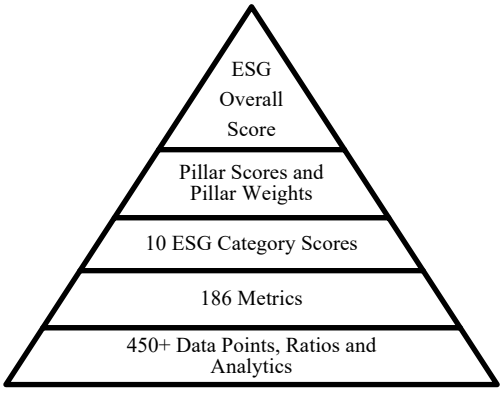
## 3.2 Research Design

### 3.2.1 Dependent Variable

To test our hypotheses, we use ESG-score as our dependent variable. The variable is sourced from Refinitiv Eikon, which includes a comprehensive ESG database. Measuring ESG performance, in general, is something that has been discussed intensively over the years. Common issues have been related to measurement problems and difficulties related to cause-and-effect relationships of measurements (Howard-Greenville, 2021). Comparing ESG scores across industries, with different sets of ESG challenges to address, is another discussed issue. However, using a well-known and established score with a rigid methodology as the one Refinitiv Eikon provides is a good way to deal with these issues and the database is also used in other studies (Velte, 2016; Arayssi et al., 2020; Birindelli et al., 2018).

The initial data that make up the ESG score is gathered to the Refinitiv Eikon database through several sources, including annual reports, CSR reports, company websites, stock exchange filings, news sources, and Non-Governmental Organisations (NGO) websites (Refinitiv, 2021). The ESG score provided in the database is based on more than 450 data points, ratios, and analytics. Out of these, 186 comparable measures are generated, and these are further separated into ten categories that make up the three pillars, Environmental, Social, and Governance. The categories for the Environmental pillar are resource use, emissions, and innovation. The Social pillar consists of the categories workforce, human rights, community, and product responsibility. Finally, the Governance pillar includes the categories management, shareholders, and corporate social responsibility strategy. The ESG score is a relative sum of the category weights, which vary per industry for the Environmental and Social categories. Figure 3.1 shows an overview of the ESG score composition. Moreover, Appendix 2 presents a table with the number of metrics in each category of the different ESG pillars. Appendix 3 further includes the definitions of each category.

**Figure 3.1**
ESG Score Composition




*Source: Thomson Reuters. (2021). Environmental, Social and Governance (ESG) scores from Refinitiv. Page 8*

### 3.2.2 Independent Variables

To test our first set of hypotheses (H1a-H1d), we use data on the percentage of females on the board (*fbm*), the percentage of independent board members (*ibm*), the size of the board in terms of number of board members (*board_size*) and data on CEO duality (*CEO_duality*) which is in line with previous board composition literature and stakeholder management (e.g., Velte, 2016; Villiers et al., 2011; Arayssi et al., 2020; Jizi et al., 2014; Muttakin and Subramaniam, 2015). The definition of an independent board member may vary to some extent across countries. The variable for independent board members in this study is the firm reported share of independent board members. The definition is bound to the rules stated by the exchange where the firm is listed, which varies to some extent.[1] Moreover, CEO duality implies that the CEO is either the chairman of the board or that the chairman of the board has previously been the CEO of the company based on the definition in the Refinitiv Eikon database, hence this variable is a dummy variable. The entire data for H1a-H1d is all sourced from Refinitiv Eikon.

Our second hypothesis (H2) is tested through three different ownership measures, namely the sum of the five largest shareholders, the Herfindahl-Hirschman index, and the largest shareholder of a company. The sum of the five (*sum5*) largest shareholders in terms of percentage of ownership is used as a proxy for ownership concentration, in line with other studies (Mavruk, Overland & Sjögren, 2020; Claessens & Djankov, 1999). Herfindahl-Hirschman index (*hhi*) is a common measure also used in previous ownership literature (Mavruk et al., 2020; Arenas-Parra & Álvarez-Otero, 2020; Dam & Scholtens, 2013). The *hhi* measure contains the important feature that ownership concentration increases if the share of any shareholders gets larger by the expense of another shareholder. Thus, a minor shareholder does not contribute proportionately to the value of the index (Curry & George, 1983). We calculate the *hhi* measure as the sum squared of the 25 largest shareholders. Optimally, this measure should have been calculated on all shareholder's ownership, but this data is not available. Thus we calculate the measure in a more simplified way. The final measure, largest shareholder (*largest_shareholder*) is defined as the percentage of ownership stake in the firm held by the largest shareholder. The motivation is to highlight the excessive power the largest shareholder may possess

[1] *For example: Nasdaq (n.d) states that an independent board members is "a person other than an Executive Officer or employee of the Company or any other individual having a relationship which, in the opinion of the Company's board of directors, would interfere with the exercise of independent judgment in carrying out the responsibilities of a director" (Rule 5605 - Nasdaq, n.d). NYSE highlights that"Independent director means a person other than an executive officer or employee of the company. No director qualifies as independent unless the issuer's board of directors affirmatively determines that the director does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director" (Part 8 - SEC 803. NYSE, n.d)*

over other shareholders in the firm and their ability to influence a firm's ESG activities seen in previous literature (e.g., López-Iturriaga & López-de-Foronda, 2011).

In order to test the impact from the board composition and ownership concentration measures over time, an optimal approach would be to construct a change regression model where we look at the change over time to facilitate the analysis. However, since our data is unbalanced, implying that some companies' ESG scores are not available from their first public year, such a method is not possible. Instead, we chose to define a life cycle dummy variable in the study. The dummy variable (*mature_dummy*) takes the value of one if the age since the IPO year of the observation is more than five years, otherwise zero. Thus, our reference dummy is that the firm observation age since IPO is between 0 and 5 years, which we refer to as the early stage since IPO year.

The amount of IPO literature that focuses on the life cycle in the long run after the IPO is rather scarce when excluding studies that focus on stock performance, where the long-run is commonly defined as after three years (e.g., Ritter, 1991). Arikan & Stultz (2016), however, focuses on corporate acquisitions in IPOs where the age since IPO is essential. They define early stage as up to three years after IPO, middle-aged as greater than three years, and mature firms as greater than nine years since IPO. Since we are rather focusing on the internal environment and the changes within a firm over time and not the firm's stock performance, it seems more reasonable to peer our choice of the public life cycle variable towards Arikan & Stultz (2016). However, as presented, we chose to only include one life cycle dummy for the mature stage that we define as more than five years since IPO. Thus, we position our study somewhere in the middle of the Arikan & Stultz (2016) study in this regard in terms of what we define as early and mature stages of the public life cycle. Also, this seems to be a viable solution considering the composition of our sample in terms of age since IPO as presented in Table 3.2 and Panel A where the cumulative size of the sample in the early stage is approximately 53%. Thus, each stage in our defined life cycle represents roughly half of the total sample size, which should imply that there are enough observations in each life cycle stage.

### 3.2.3 Control Variables

In line with previous research, we also control for several firm characteristic factors that might affect the ESG score over time after an IPO. Larger firms in terms of total assets and firms with higher profitability are expected to be able to invest more in social and environmental projects and be able to disclose more on their initiatives. Drempetic et al. (2019) provide empirical evidence in this direction as they conclude that there is a positive correlation between firm size and ESG-scores. Thus, we include the logarithmic of total assets as a proxy for size (*size*), which is also in line with other studies where ESG-score is used as a dependent variable (Arayssi et al., 2018; Velte, 2016; Birindelli et al., 2018).

Similar positive relation is expected by a firm's profitability in line with previous studies (Arayssi et al., 2018; Velte, 2016; Birindelli et al., 2018). Thus, we chose to also control for return on assets (*roa*). Finally, to account for capital structure effects, we include leverage as a control variable where previous literature shows that firms with high leverage have a negative relationship with CSR (Barnea & Rubin, 2010) and ESG (Arayssi et al., 2020). The motivation is, among others, that firms that are highly leveraged have limited available resources to increase their level of ESG disclosure and ESG initiatives which in turn should have a negative impact on the ESG-scores. Thus, we chose to also control for leverage (*leverage*) and define it as the ratio of the total debt to the total equity similarly to previous studies (Barnea & Rubin, 2010; Arayssi et al., 2020). The data for the control variables are retrieved from Refinitiv Eikon. Appendix 4 shows an overview of all the variables as well as the definition of each of them.

## 3.3 Descriptive Statistics

Panel A in Table 3.2 illustrate the descriptive statistics of each variable in our final data set. All continuous variables except *fbm* and *size* are winsorized at the 1st and 99th percentile in order to adjust for outlier values that may skew the results. *Fbm* is further only winsorized in the upper tail at the 99th percentile, and *size* is only winsorized in the lower tail at the 1st percentile. Winsorizing is in line with previous IPO literature (e.g., Arikan & Stulz, 2016), and the distance from the min and max values to the 1st and 99th percentile is the determining factor where longer distance implies a more extreme outlier and influences the result heavily. Hence, adjustment is justified. The rationale of one-sided winsorization for *fbm* and *size* is due to the minor difference between the outlier value and the chosen percentile cuts. More specifically for *fbm* the difference is zero. An alternative way of handling the outliers would be through truncation, simply dropping the extreme values. However, this would reduce the sample size, which is why we chose to use winsorizing instead. The descriptive statistics before winsorizing is applied is shown in Appendix 5.

From Panel A in Table 3.2, we observe that the mean value of *esg_score* in the final dataset is 33 and has a skewness of 0.831, indicating a longer right tail. The low mean value of 33 and the right skewness is most likely a result of the sampling and data availability of ESG scores. Following the idea of our study that the time as a public company should have an effect on the ESG score improvement in combination with the fact that our sample in terms of *age since IPO* is right-skewed with a mean value of approximately six years and a median of five years, this does not come as a surprise. However, it is still important to acknowledge and be aware of when interpreting the results. Further, the mean value of *fbm* in the dataset is 15%, considerably low, and with a mean *board_size* of nine, this would imply that the average board consists of approximately one female. Independent board members (*ibm)* have a

mean of 74 %, which suggests a rather high level of independence. *CEO_duality* is present on average in 46 % of the firms. The ownership concentration in terms of the five largest owners (*sum5)* represents 39 % of the ownership of the firm on average. The *largest_shareholder* holds a 15% ownership stake of a firm on average and the *hhi* shows an ownership concentration of 6.090 on a scale from 0-100, a rather dispersed ownership concentration on average. Both *largest_shareholder* and *hhi* have a high kurtosis and are also right-skewed. The skewness, as well as kurtosis, are also considerable for the variables *roa* and *leverage*. In the case of *roa* the skewness derives from several firms being unprofitable, which might result from the sample containing relative young firms, at least in terms of years in the public environment. The mean *roa* in the sample is slightly negative at -0.8%, whereas the median *roa* is positive at 2.5%, resulting from a negative skewness. The variable *leverage* shows a high kurtosis value of 23, indicating that the leverage ratio is on average similar across all firm observations in the sample. The variable is also positively skewed, indicating several firms with a very high level of leverage.

Panel B in Table 3.2 show the correlation matrix of the variables in the study. Several variables, including *hhi*, *sum5* and *largest_shareholder*, are highly correlated with values above 0.7. *Hhi* has a correlation with *sum5* of 0.848 and 0.969 with the *largest_shareholder*. *Sum5* has a correlation with the *largest_shareholder* of 0.865. This is not surprising considering that they partially contain the same data. High correlation, larger than +/- 0.7, usually raises multicollinearity concerns where the independent variables are correlated with each other resulting in an abnormal standard error which creates difficulties when interpreting the results (Tabachnick & Fidell, 1996). Despite the fact that we have some variables with correlation above this threshold, this concern is not relevant since the different independent variables are not included in the same regression models. Thus, we have no multicollinearity concerns.

Appendix 6 shows the panel descriptive statistics and depicts that the sample consists of 2813 yearly observations across 710 firms. Hence the average number of years observed per firm is approximately four years. The time dimension observed in each firm on average is thus rather short, making the data more of a micro panel data set with few years and a larger number of firms.

**Table 3.2**

Descriptive Statistics and Correlation Matrix

| Panel A: Descriptive Statistics | N | mean | median | sd | skewness | kurtosis |
|---|---|---|---|---|---|---|
| esg_score | 2813 | 33.503 | 30.215 | 15.783 | 0.831 | 3.214 |
| fbm | 2813 | 14.487 | 12.500 | 11.523 | 0.635 | 3.165 |
| ibm | 2813 | 74.264 | 77.778 | 15.560 | -1.147 | 3.852 |
| board_size | 2813 | 8.989 | 9.000 | 2.116 | 0.610 | 3.566 |
| ceo_duality | 2813 | 0.461 | 0.000 | 0.499 | 0.158 | 1.025 |
| sum5 | 2813 | 39.307 | 37.212 | 13.004 | 1.195 | 4.595 |
| hhi | 2813 | 6.090 | 4.024 | 7.517 | 3.686 | 17.632 |
| largest_shareholder | 2813 | 15.141 | 11.482 | 11.691 | 2.768 | 10.884 |
| mature_dummy | 2813 | 0.467 | 0.000 | 0.499 | 0.133 | 1.018 |
| roa | 2813 | -0.793 | 2.479 | 17.227 | -2.354 | 10.186 |
| leverage | 2813 | 0.953 | 0.417 | 3.051 | 2.723 | 23.246 |
| size | 2813 | 7.769 | 7.742 | 1.659 | 0.254 | 2.767 |

| Panel B: Correlation Matrix | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) esg_score | 1.000 | | | | | | | | | | | |
| (2) fbm | 0.350 | 1.000 | | | | | | | | | | |
| (3) ibm | 0.349 | 0.237 | 1.000 | | | | | | | | | |
| (4) board_size | 0.235 | 0.091 | -0.003 | 1.000 | | | | | | | | |
| (5) ceo_duality | 0.037 | 0.007 | 0.007 | 0.041 | 1.000 | | | | | | | |
| (6) sum5 | -0.187 | -0.104 | -0.124 | -0.072 | 0.078 | 1.000 | | | | | | |
| (7) hhi | -0.133 | -0.109 | -0.149 | 0.011 | 0.038 | 0.848 | 1.000 | | | | | |
| (8) largest_shareholder | -0.137 | -0.114 | -0.164 | 0.012 | 0.041 | 0.865 | 0.969 | 1.000 | | | | |
| (9) mature_dummy | 0.131 | 0.071 | 0.075 | 0.017 | -0.096 | -0.047 | -0.018 | -0.030 | 1.000 | | | |
| (10) roa | 0.160 | 0.080 | -0.059 | 0.158 | -0.067 | -0.093 | -0.030 | -0.010 | 0.148 | 1.000 | | |
| (11) leverage | 0.040 | 0.056 | 0.021 | 0.040 | 0.020 | 0.036 | 0.030 | 0.037 | -0.018 | 0.010 | 1.000 | |
| (12) size | 0.354 | 0.127 | -0.022 | 0.405 | -0.049 | -0.163 | -0.003 | -0.011 | 0.129 | 0.383 | 0.131 | 1.000 |

*All continuous variables except fbm and size have been winsorized at the 1st and 99th percentile in order to reduce biased results from extreme outliers. The variable fbm is winsorized at the 99th percentile only and the variable size is winsorized at the 1st percentile only.*

## 3.4 Fixed or Random Effects

To determine whether a fixed or a random-effects model is most appropriate for our setting, we conduct a Hausman specification test. The test's null hypothesis is that the difference between the random effects estimators and the fixed effects estimators is zero and essentially that there is no correlation between the error term and our independent variables. We run the test on our main regression model, and the results show that the difference between the fixed and random effects estimators are large, and all the tests have a probability of 0. Thus, the null hypothesis can be rejected. This implies that we reject no correlation between the panel effects and the independent variables, indicating an endogeneity problem. Hence a fixed-effects model seems most appropriate. The fixed-effects model solves the problem of time-invariant effects within each firm that may impact or bias our results. The fixed-effects model removes these effects and enables us to assess the net effect of the predictor value. The time-invariant effects are all different among entities and could, in our case, be related to several factors. For example the company culture and the related attitude towards the stakeholder agenda, the local political system which could vary across states in the US, business practices of the company among other unique firm characteristics.

Apart from controlling for entity fixed effects, we chose to also control for time fixed effects which is appropriate if the dependent variable is expected to change over time but not cross-sectionally. This would imply that we allow the intercept to vary over time but would be assumed to be constant across the same firm at each given point in time. We assure the need for time fixed effects by running a test on all fiscal years to see if the dummies for all years are equal to zero, which would imply no need for time fixed effects. We run the test on the main regression model, and the results indicate that we can reject the null hypothesis for all seven models and conclude that time fixed effects are necessary. A potential example of a circumstance that the time effects model can control for in our case is regulatory changes that affect the ESG score, but to the same extent across all firms. We may also assume that the increased general attention and pressure on the stakeholder agenda could be one effect that the time fixed effects remove, enabling more precise analysis of the actual effects of interest over time. One example related to this could be the Paris agreement that was signed in December 2015 (UNCC, n.d.), and that arguably has accelerated the ESG agenda across all firms. Combining the entity fixed model and the time fixed model implies that we arrive at a two-way error component model.

## 3.5 Regression Model

To test the hypotheses, we use the following general two way fixed effects error component model:

***Equation 3.1***

$$ESG_{it} = \alpha_0 + \beta_1 Independent_{it-1} + \beta_2 Mature\_dummy_{it-1} + \beta_3 IndependentXmature_{it-1} + \beta_4 Controls_{it-1} + \mu_i + \lambda_{ti} + \nu_{it}$$

where *ESG* represents the dependent variable ESG-score for firm *i* at time *t* (*i* = 1, …, N; *t* = 1, ..., T), $\alpha_0$ is the intercept of the equation, $\beta_1$ is the coefficient estimate of each independent variable (board composition and ownership concentration), $\beta_2$ is the coefficient estimate of the mature stage dummy variable which represents the marginal effect on ESG in the mature stage when the main variable of each regression is assumed to be zero, a rather theoretical state for some of the main variables. $\beta_3$ is further the coefficient estimate of the interaction term between the independent variable (board composition and ownership concentration) and the mature dummy. The interaction term represents the marginal difference between the impact on the dependent variable in the mature stage relative to the early stage from each specific independent (board composition and ownership concentration) variable. The interaction term is the coefficient that tests our hypotheses and enables an analysis of the impact over time after an IPO. $\beta_4$ are moreover a vector of the coefficient estimates of the control variables *leverage*, *roa*, *size*. Further, $\mu_i$ represents the firm fixed effects and the variables that affect the dependent variable across firms but do not vary over time, $\lambda_t$ represents the time fixed effects that capture all variables that affect ESG score and vary over time but are constant across firms. Finally, $\nu_{it}$ is the remainder disturbance, capturing the unexplained variation of the dependent variable ESG score.

The equation also indicates that the independent variables, and the control variables, are lagged by one year to better capture the impact. The rationale behind this is that we expect the independent variables to have a lagged effect on ESG scores. Lagging implies that the sample size in terms of yearly observations is reduced by one for each firm. The lagged sample is further the sample shown in all previous Tables 3.1 and 3.2 with 2813 observations. Finally, we chose to run the model with standard errors clustered on a firm-level assuming that ESG scores are not independently distributed across firms but rather correlated within firms. That is, we assume that the ESG scores over the years are correlated within the firm.

To deepen the analysis, we also choose to include the marginal effects of the independent variables on ESG in the mature stage based on the results from Equation 3.1. The inclusion of the results facilitates a broader understanding of the impact of our independent variables on ESG in the mature stage of the public life cycle. We calculate the marginal effect in the mature stage as the sum of the coefficients in the early stage and the interaction term and run a t-test on this coefficient. In order to be able to interpret

the marginal effect in the mature stage, it requires that at least one of the coefficients in the early stage or the interaction term in the main result to be significant, otherwise no certain marginal effect can be computed in the mature stage.

## 3.6 Heteroscedasticity

In order to see whether our data suffers from heteroscedasticity, we conduct a Breusch-Pagan test on our main regression model. Test for heteroscedasticity implies an interpretation of whether the residuals are systematically spread out over the fitted values (Breusch & Pagan, 1979). The p-value for all seven models is 0, which implies that we can reject the null hypothesis and conclude that there exists a variance among the residuals in the population when ESG scores are the dependent variable. Thus, heteroscedasticity is present for all our variables. Appendix 7 shows that all variables have a similar dispersed variance. In order to mitigate the heteroscedasticity issue, we use robust standard errors clustered by firms in all regressions. This type of standard error accounts for heteroscedasticity across firm observations and is suitable when analyzing panel data and applying fixed effects (Abadie, Athey, Imbens & Woolridge, 2017).

## 3.7 Robustness Test

In order to test the robustness of our results, we choose to conduct several robustness tests. Namely, we run the main regression model with an alternative ESG score that includes a controversies parameter. The mature stage of the public life cycle is also varied as a robustness test. Further, we chose to run the model without winsorizing. Finally, we also perform a Two-Stage Least Squares model (2SLS) to control for endogeneity concerns.

### 3.7.1 ESG Score Robustness

A natural limitation to the study is the reliance on the ESG score as an adequate proxy for stakeholder management. Using the score provided by Refintiv Eikon is considered to be the best possible choice of measure. However, despite a rigid methodology with a comprehensive framework of the score, it is to a large extent affected by the level of disclosure through annual reports, CSR reports, company websites, stock exchange filings, news publications, NGOs, and websites (Refinitiv, 2021). The quality and reliability of using the ESG score as a proxy for stakeholder management could thus be questioned, and it might not be the best possible metric with regards to truly measuring a firm's stakeholder management. Based on this concern, we chose to also run our regression with an alternative ESG score, namely the ESG-combined score, also sourced from Refintiv Eikon. The ESG-combined score adds a controversies dimension based on 23 additional data points (Refintiv, 2021). This overall score discounts the ESG score for news controversies that materially impact corporations (Refinitiv, 2021).

Thus, the combined score is a combination of the three pillars and ESG controversies captured from global media sources and commonly implies that the ESG performance is discounted based on negative media events.

### 3.7.2 Mature Stage Robustness

The essence of the main equation model (3.1) is the interaction term and the dummy variable of the mature stage of the public life cycle. The mature stage is defined as more than five years after the IPO in the main model, selected with considerations to Arikan & Stulz (2016). Despite motivating our choice based upon other IPO studies, the choice is, and will always be, arbitrary. It is also conditioned on the idea that an IPO firm is expected to be set under an increased stakeholder pressure over time in the public environment where board composition and ownership concentration should be factors facilitating a better stakeholder management, proxied through ESG score. Therefore, varying the mature stage definition is a logical robustness test that we chose to conduct by changing the mature stage dummy one year in both directions.

### 3.7.3 Outlier Management Robustness

Winsorizing is a good approach to reduce the severe impact from outliers. However, the approach may also skew the results. Therefore, running the main regression model without winsorizing is considered a good robustness test to conclude that the data management approach does not change the results.

### 3.7.4 Endogeneity Concerns

Using fixed firm and time effects implies that we control for some endogeneity. However, there might still be other sources of endogeneity concerns to consider. Our independent variables also represent by nature a part of the metrics used to generate the ESG score by Refinitiv Eikon. However, in accordance with the correlation test presented in Panel B in Table 3.2, the correlation between the independent variables and ESG score is below what can be considered as problematic. Further, one adjustment that we still choose to make to account for this potential endogeneity issue is that we lag all independent variables.

Another potential endogeneity concern is reverse causality between the dependent variable and our independent variables. Previous literature has shown that board governance measures such as gender diversity may exhibit this pattern (e.g., Adams & Ferreira, 2009). To illustrate this, females on the board could influence a firm's ESG score. However, the relationship may be the reverse, that females are more likely to appoint a board of a firm that performs well in terms of ESG and already have a high ESG-score. That is, females may be more willing to accept a board position in a firm with good ESG performance. This would imply that there are risks for wrong interpretations of female board members

causal effect on firms ESG scores. The same may reasonably also hold for independent board of directors following the logic of them being more likely to appoint a board with a larger presence of independent members. Thus, our variable *ibm* may also possess this concern.

A potential solution to solve for endogeneity concerns is to use the 2SLS model with an appropriate instrumental variable. Applying the 2SLS model is not unproblematic since it requires a suitable variable that can be used as an instrument that can be difficult to find. For example, Dam and Scholtens (2013) exhibit this issue and did not find an appropriate instrumental variable in their study testing the impact of ownership concentration on a firm's CSR performance. However, there are other studies in the field of board composition and ownership concentration that use the industry average per year as an instrument (e.g., Harada & Nguyen, 2011), an approach that we also choose to use but with sector average instead.

Before conducting a 2SLS, we need to ensure whether each independent variable (board composition and ownership concentration) should be treated as an endogenous variable. We do this by running a regression with the main variable (board composition and ownership concentration) as the dependent variable and the mature dummy time variable, and the set of controls as explanatory variables. The predicted residuals from this regression are then included in the main equation, and if the coefficient of the residuals is significant, then the main variable can be considered endogenous. All coefficients of the seven main variables are significant and hence treated as endogenous variables. This further implies that performing a 2SLS is motivated.

The instrument variable that we chose to use in the 2SLS in each model is the sector average per year of each main variable, based on the sectors in Table 3.1. We choose to use the sector average, which is based on 11 sectors instead of the industry average provided by the database that is divided into 66 industry groups (Refintiv Eikon, 2021). Each sector thus consists of several industries. We consider sector to be more appropriate due to our sample composition since we avoid the issue of average yearly observations being based on few observations.

The choice of instrument is motivated by the fact that there is most likely unobservable sector information influencing firms' board composition and ownership structures. For example, the appearance of female board members in a specific sector might be affected by the historical level, the cultural setting, or stakeholder expectations.

The predicted interaction term for each independent variable is computed by multiplying *mature_dummy* and the predicted coefficient of the instrument variable of each model. The predicted interaction term is the main variable of interest. Thus, the second stage of the 2SLS model is regressed

on ESG score with the instrumented main variable (board composition and ownership concentration), the predicted interaction term, the life cycle dummy and the set of control variables as explanatory variables.

# 4. Regression Results

## 4.1 Main Results

Table 4.1 shows the main results from running Equation 3.1 and includes seven regression Models (1) to (7). Model (1) presents the regression results with female board members as the variable of interest. The coefficient of *fbm*, the marginal effect in the early stage, is insignificant, which is also the case for the interaction variable *fbmXmature* that tests Hypothesis H1a. Hence, the interaction variable's results do not reject the null hypothesis. The coefficient of the life cycle dummy *mature_dummy* is also insignificant. Regarding the control variables, the coefficient of *size* is found to be positive and significant, however only on a 10% level. The coefficients of l*everage* and *roa* are insignificant.

Model (2) represents the regression results on the impact from independent board members. The coefficient of *ibm* is positive and significant on a 1% level, suggesting that one additional unit of independent board members results in an increased ESG score by 0.122 in the early stage of the public life cycle. The coefficient of the interaction term *ibmXmature,* which tests the Hypothesis H1b, is 0.090, indicating that independent board members positively impact ESG scores in the mature stage relative to the early stage of the public life cycle. The impact is significant on a 1% level, indicating that the null hypothesis can be rejected. The life cycle dummy *mature_dummy* is further negative and significant on a 1% level with a coefficient of -6.037, indicating a negative relative effect on the dependent variable in the mature stage when independent board members are assumed to be zero. The coefficients of the control variables *leverage* and *size* are both positive and significant, however only on a 10% level. The coefficient of *roa* is further insignificant.

Model (3) presents the results from the regression where board size is the main variable. The coefficient of *board_size*, the marginal effect in the early stage, is insignificant, which is also the case for the interaction term *boardsizeXmature* that tests the Hypothesis H1c*,* hence not rejecting the null hypothesis. The coefficient of the life cycle dummy *mature_dummy* is also insignificant. Moreover, the coefficient for *leverage* is positive and significant, however, only on a 10% level. The coefficient of *roa* and *size* are both insignificant.

Model (4) presents the regression results with CEO duality as the variable of interest. The coefficient of *ceo_duality* is negative and significant on a 1% level, suggesting that the presence of CEO duality in the early stage of the public life cycle has a negative effect on the ESG score by -2.867. The relative effect in the mature stage through the interaction term *ceodualityXmature* that tests Hypothesis H1d shows an insignificant coefficient, hence not rejecting the hypothesis. The coefficient of the life cycle variable *mature_dummy* is positive and significant, however, only on a 10% level. The coefficients of all control variables are insignificant.

Models (5) to (7) includes the regressions on the ownership concentration dimension, where Model (5) is the regression with the sum of the five largest shareholders as the variable of interest. The coefficient of *sum5* is positive and significant on a 1% level in the early stage, suggesting that one additional unit in terms of ownership stake among the five largest shareholders in the early stage of the public life cycle will increase the ESG score by 0.097. The interaction term *sum5Xmature* that tests Hypothesis H2 shows an insignificant coefficient, hence not rejecting the null hypothesis. The coefficient of the life cycle dummy *mature_dummy* is also insignificant. The coefficient of l*everage* is the only control variable that is significant, however only on a 10% level.

Model (6) includes the ownership concentration measure Herfindahl-Hirschman index. The coefficient of *hhi* is positive and significant on a 1% level, suggesting that one additional unit in terms of ownership concentration in a firm in the early stage of the public life cycle will positively affect the ESG score by 0.246. The interaction term *hhiXmature*, which tests Hypothesis H2, shows a negative and significant coefficient on a 1% level, indicating that ownership concentration has a negative impact on ESG score in the mature stage of the public life cycle relative to the early stage by -0.128. Hence, this indicates that the null hypothesis is rejected. The coefficient of the life cycle dummy *mature_dummy* shows a positive and significant relationship, however only on a 10% level. Assuming *hhi* to be zero is a very theoretical and rather unlikely scenario, and with regard to the significance level, the result should be interpreted with caution. The coefficient of *leverage* and *size* is positive and significant, however only on a 10% level. The coefficient of *roa* is insignificant.

The final Model (7) is regressed with the largest shareholder as the variable of interest. The coefficient of *largest_shareholder* is positive and significant on a 1% level, indicating that one additional unit in the ownership stake of the largest shareholder in the early stage of the public life cycle will increase the ESG score by 0.146. The interaction term *largest_shareholderXmature* that test Hypothesis *H2* shows a negative and significant coefficient on a 5% level, implying that the ownership stake by the largest shareholder in the mature stage relative to the early stage of the public life cycle has a negative impact on ESG score by -0.075. Hence, this indicates that the null hypothesis is rejected. Moreover, the life cycle dummy is positive and significant on a 10% level. The control variables exhibit a similar pattern

as in Model (6), with the coefficient of *leverage* and *size* being significant on a 10% level. However, concerning the level of significance for the *mature_dummy*, *leverage* and *size*, the results should be interpreted cautiously. The coefficient of *roa* is further insignificant in Model (7). All models (1) to (7) have an R-squared value between 0.425-0.445.

**Table 4.1**

Main Regression Results

| VARIABLES | (1) esg_score | (2) esg_score | (3) esg_score | (4) esg_score | (5) esg_score | (6) esg_score | (7) esg_score |
|---|---|---|---|---|---|---|---|
| fbm | 0.071 | | | | | | |
| | (1.646) | | | | | | |
| fbmXmature | 0.062 | | | | | | |
| | (1.101) | | | | | | |
| ibm | | 0.122*** | | | | | |
| | | (4.476) | | | | | |
| ibmXmature | | 0.090*** | | | | | |
| | | (3.091) | | | | | |
| board_size | | | -0.334 | | | | |
| | | | (-1.076) | | | | |
| boardsizeXmature | | | 0.491 | | | | |
| | | | (1.606) | | | | |
| ceo_duality | | | | -2.867*** | | | |
| | | | | (-2.691) | | | |
| ceodualityXmature | | | | -1.626 | | | |
| | | | | (-1.435) | | | |
| sum5 | | | | | 0.097*** | | |
| | | | | | (2.893) | | |
| sum5Xmature | | | | | -0.054 | | |
| | | | | | (-1.298) | | |
| hhi | | | | | | 0.246*** | |
| | | | | | | (4.517) | |
| hhiXmature | | | | | | -0.128*** | |
| | | | | | | (-2.765) | |
| largest_shareholder | | | | | | | 0.146*** |
| | | | | | | | (3.969) |
| largest_shareholderXmature | | | | | | | -0.075** |
| | | | | | | | (-1.970) |
| mature_dummy | -0.018 | -6.037*** | -3.674 | 1.582* | 2.876 | 1.451* | 1.876* |
| | (-0.017) | (-2.670) | (-1.344) | (1.905) | (1.543) | (1.826) | (1.896) |
| leverage | 0.093 | 0.114* | 0.111* | 0.088 | 0.108* | 0.105* | 0.103* |
| | (1.552) | (1.857) | (1.764) | (1.469) | (1.778) | (1.740) | (1.697) |
| roa | 0.003 | 0.009 | 0.006 | 0.008 | 0.006 | 0.006 | 0.005 |
| | (0.169) | (0.525) | (0.342) | (0.456) | (0.323) | (0.326) | (0.251) |
| size | 1.094* | 1.021* | 0.949 | 0.883 | 0.942 | 1.088* | 1.063* |
| | (1.932) | (1.805) | (1.581) | (1.525) | (1.563) | (1.795) | (1.759) |
| Constant | 3.865 | -0.345 | 7.874 | 6.556 | 0.785 | 2.209 | 1.554 |
| | (0.486) | (-0.045) | (0.909) | (0.801) | (0.093) | (0.260) | (0.184) |
| Observations | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 |
| R-squared | 0.428 | 0.445 | 0.425 | 0.433 | 0.426 | 0.430 | 0.428 |
| Number of id | 710 | 710 | 710 | 710 | 710 | 710 | 710 |
| Year FE/Firm FE | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES |
| Prob > F | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Robust t-statistics in parentheses

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

*The table shows the results from the main regression equation. The time variable mature_dummy takes the value of 1 if the observations is more than 5 years since IPO year. R-squared is presented as the within variation. All continuous variables except fbm and size have been winsorized at the 1st and 99th percentile in order to reduce biased results from extreme outliers. The variable fbm is winsorized at the 99th percentile only and the variable size is winsorized at the 1st percentile only.*

## 4.2 Marginal Effects in the Mature Stage

Table 4.2 shows the marginal effects in the mature stage of the public life cycle. We cannot interpret any marginal effect in the mature stage for the variables *fbm* and *board_size* due to the insignificant coefficients shown in Table 4.1. It is also worth highlighting that the coefficient of *ceo_duality* and *sum5* are only significant in the early stage in the main results in Table 4.1, however, we still choose to present the coefficients in the mature stage for these two variables but the results should be interpreted with caution. The marginal effect of *ibm* in the mature stage related to Model (2) in Table 4.1 shows a positive and significant coefficient on a 1% level. The result suggests that one additional unit of independent board members in the mature stage will increase the ESG score by 0.212. The relative effect of *CEO_duality* in the mature stage related to Model (4) in Table 4.1 shows a negative and significant coefficient on a 1% level. The result suggests that the presence of CEO duality in the mature stage has a negative effect on the ESG score by 4.493.

On the ownership dimension, the marginal effect of *sum5* in the mature stage related to Model (5) in Table 4.1 shows an insignificant coefficient. The marginal effect of *hhi* in the mature stage related to Model (6) in Table 4.1 shows a positive and significant coefficient on a 5% level, suggesting that one additional unit of ownership concentration through *hhi* will increase the ESG score by 0.118. Lastly, the marginal effect of *largest_shareholder* in the mature stage related to Model (7) in Table 4.1 shows a positive and significant coefficient, however, only on a 10% level.

**Table 4.2**
Marginal Effects in the Mature Stage

| VARIABLES | |
|---|---|
| Model (2) ibm | 0.212*** |
| | (7.120) |
| Model (4) ceo_duality | -4.493*** |
| | (-4.150) |
| Model (5) sum5 | 0.043 |
| | (1.190) |
| Model (6) hhi | 0.118** |
| | (2.300) |
| Model (7) largest_shareholder | 0.071* |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

*The table shows the marginal effects from the independent variables on ESG score in the mature stage based on the main regression model. The mature stage is defined as more than 5 years since IPO year.*

## 4.3 Robustness Results

The robustness of our main result is tested by varying several parameters, and the results are presented in Appendix 8 to 12. The overall results of the robustness tests provide only minor differences, indicating that our main results in Table 4.1 are considered robust.

### 4.3.1 ESG Score Robustness

The results from running the main equation (3.1) with the alternative ESG score are presented in Appendix 8. The results can be considered to be robust and in line with the main results in Table 4.1 for Model (1) to Model (6), although with some minor exceptions. In Model (1), *fbm* shows a positive and significant coefficient, however only on a 10% level in the early stage, compared to the insignificant coefficient found in the main results in Table 4.1. Further, the significance level has decreased to a 5% level in Model (4) for the coefficient of *ceo_duality* and Model (5) for the coefficient of *sum5* compared to the 1% level of significance in the main results in Table 4.1.

Model (7) with the largest shareholder is the regression with the largest difference compared to the main results in Table 4.1. The coefficient of the interaction term for largest shareholder *largest_shareholderXmature* is insignificant compared to the 5% level of significance in the main model.

It is also worth highlighting that the coefficients of the control variables are insignificant throughout all regression models and that the coefficient of the mature dummy for Models (4), (6), and (7) are insignificant. Overall, the results are considered to be robust when using this alternative score that takes controversies into account. The main differences in the results can be found in the mature stage in Model (7) and for the control variables.

### 4.3.2 Mature Stage Robustness

Appendix 9 presents the main equation model with the mature dummy defined as more than four years since IPO. The results are considered to be overall robust and similar for Model (1) to Model (5) except for the coefficient of *fbm* in Model (1) that is significant, however only on a 10% level, compared to the insignificance in the main results in Table 4.1. The coefficients of the interaction term in Models (6) and (7) are further insignificant contrary to the main results in Table 4.1. The overall significance in all models for the coefficient of *mature_dummy* is more significant than the main results in Table 4.1.

Moreover, Appendix 10 presents the main equation with the mature dummy defined as more than six years since IPO. The main results in Table 4.1 are considered robust and similar for all seven models in

this scenario except for the coefficient of *fbm* in Model (1), which shows a level of significance of 5% compared to the insignificant result in the main results in Table 4.1.

To conclude, despite some minor differences, the main results in Table 4.1 are considered robust to changes in the mature dummy life cycle stage.

### 4.3.3 Main Results Without Winsorizing

Appendix 11 shows the results of the main regression model when running the regressions without winsorizing the continuous variables. The results are considered robust in all models with only minor differences in significance in Model (6) and Model (7) for the coefficient of the interaction term. The coefficient of the control variable *leverage* further shows a better significance throughout all models compared to the main results in Table 4.1, indicating that the extreme outliers affect the level of significance.

### 4.3.4 Two-Stage Least Squares Results

Appendix 12 presents the results of the second stage of the 2SLS model with the instrumented main variables and the instrumented interaction effects of Models (1) to (7). Considering the interaction terms, the overall results are robust, containing only minor differences from the main model in Table 4.1. The minor differences can be seen in Models (1) and (2). Model (1) and the coefficient of the variable *IV_fbmXmature* show a significant impact in the mature stage relative to the early stage, however only on a 10% level, compared to the insignificance shown in the main result of Table 4.1. Model (2) and the coefficient of *IV_ibmXmature is* insignificant, deviating from the main result in Table 4.1. An important insight to bear in mind considering these results are the choice of instrument and the possibility that the instrument is not exogenous enough or that there are other exogenous variables more suitable as an instrument.

## 4.4 Summary of Results

As seen in the main results in Table 4.1, the board composition dimension and the interaction term for Model (2) with independent board members as the variable of interest indicate that Hypothesis H1b can be rejected. This suggests that independent board members have a positive impact on ESG in the mature stage of the public life cycle relative to the early stage. Model (1) on female board members, Model (3) on board size, and Model (4) on CEO duality all show insignificant coefficients of the interaction term. On the ownership concentration dimension, Model (6) with the Herfindahl-Hirschman index and Model (7) with the largest shareholder both indicate that Hypothesis H2 can be rejected, suggesting that ownership concentration has a negative impact on ESG in the mature stage relative to the early stage of

the public life cycle. The coefficient of the interaction term for Model (5) with the sum of the five largest shareholders is insignificant.

As presented in Table 4.2, *ibm*, *hhi*, and *largest_shareholder* have a positive marginal impact on ESG in the mature stage of the public life cycle, although with coefficients at varying levels of significance. The presence of *CEO_duality* in the mature stage has a negative relative impact on the ESG score. The coefficient of *sum5* is moreover insignificant in the mature stage.

Finally, as presented in Appendixes 8 to 12, the overall results of the robustness tests provide only minor differences compared to the main results in Table 4.1, indicating that our main results can be considered robust.

# 5. Analysis & Discussion

## 5.1 Board Composition and ESG

### 5.1.1 Female Board Members

The results on the board composition dimension and the first Hypothesis (H1a) on female board members show an insignificant relationship seen in the interaction term, suggesting that we cannot reject the null hypothesis. It implies that we cannot conclude that female board members have a positive impact on ESG scores in the mature stage relative to the early stage of the public life cycle. Further, female board members do not significantly affect ESG scores in the early stage of the public life cycle either. While a positive relationship has been present in previous studies (e.g., Arayssi et al., 2020; Velte, 2016), the results are not in line with our expectations.

There are several potential reasons why the expected relationship is not present in this sample. One explanation could be linked to the finding by Birindelli et al. (2018), where gender-balanced boards are associated with a positive influence on ESG performance. However, gender-balanced boards are not common, at least when judging from our sample in Table 3.2, where the average board consists of 15%, which is approximately one board member since the average board size in the sample is nine. In other words, the appearance of female board members in our sample is very low, most likely impacting our results. That is, the variation in the sample is low, and there are few companies with a large share of female board members. This is further seen in Appendix 1, where the 95th percentile on female board members is 35%, and the 99th percentile is 50%, indicating that only a small fraction of the boards in the sample are gender-balanced. If we speculate, the presence of the female board members over time after an IPO in our sample may therefore possess more of a token role in the board, a symbolic role with

an insignificant level of influence. If this idea holds, it would mean that boards do not utilize the benefits of having female board members, such as their capability to contribute to lower communication barriers (Bear et al., 2010), being more inclusive towards the broader base of stakeholders (Velte, 2016) and possessing a more democratized decision-style (Gupta et al., 2015), abilities that should impact stakeholder management and thus ESG scores positively.

### 5.1.2 Independent Board Members

The results related to the second Hypothesis (H1b) on independent board members show that the coefficient of the interaction term has a positive and significant impact, suggesting that we can reject the null hypothesis. This implies that we can conclude that independent board members positively impact ESG scores in the mature stage of the public life cycle relative to the early stage of the public life cycle, in line with our expectations. Apart from this, our regression analysis also shows that the marginal effect in the early stage and the mature stage is positive and significant. The relationship is in line with previous literature on ESG scores (e.g., Cucari, 2018; Arayssi et al., 2020) and CSR (e.g., Reeb and Zhao, 2013; Villiers et al., 2011; Zhang et al., 2013; Deschênes et al., 2015). The significant impact is most likely explained in line with previous literature, where independent board members are said to be more efficient in their decision-making (Holtz & Sarlo Neto, 2014), function as a catalyst for improved ESG activities and facilitates a good relationship between a firm's financial targets and social responsibility (Arayssi et al., 2020). Furthermore, broadening the perspectives of a firm's stakeholder management to not only focus on the shareholder's interests (Deschênes et al., 2015). We speculate that these explanations are accurate in our sample as well and that these effects are amplified over time when stakeholder pressure increases as a natural consequence of going public, explaining our positive and significant coefficient of the interaction term.

### 5.1.3 Board Size

The third Hypothesis (H1c) on the board composition dimension is related to board size. The coefficient of the interaction term is insignificant, suggesting that we cannot reject the null hypothesis. This implies that we cannot conclude that board size positively impacts ESG score in the mature stage relative to the early stage of the public life cycle. Furthermore, the marginal impact in the early stage of the public life cycle is also insignificant. The overall results are not in line with our expectations, nor previous literature that shows a positive impact from board size on ESG (Birindelli et al., 2018) and on CSR (e.g., Jizi, 2017; Kaymak & Bektas, 2017; Villiers et al., 2011).

The potential explanations for why we do not exhibit the expected relationship could be many. One factor that has not been taken into account is the practical limitation on how large a board can be. There is arguably a maximum number of board members in a board and a threshold where the positive aspects of a larger board diminish. While it is said that larger boards can provide broader perspectives (Boone

et al., 2007), diverse knowledge and advice (Dalton et al., 1999), and a greater ability to satisfy more complex sets of stakeholders (Kaymak & Bektas, 2017), our results do not confirm such aspects. Worth to mention here, related to our insignificant results, is that the average board size in our sample is rather large of approximately nine board members with a standard deviation of two (Table 3.2), indicating that the variation is relatively small, which may impact and explain the insignificance of our results.

### 5.1.4 CEO Duality

The last hypothesis on the board composition dimension is related to CEO duality (H1d). The coefficient of the interaction term for CEO duality shows an insignificant impact on ESG score, suggesting that we cannot reject the null hypothesis. This implies that we cannot conclude that CEO duality has a negative impact on ESG scores in the mature stage relative to the early stage of the public life cycle. However, our results do suggest that CEO duality has a negative and significant relative impact in the early stage as well as in the mature stage of the public life cycle, a relationship in line with previous research on ESG scores (Arayssi et al., 2020) and CSR (Alabdullah, Ahmed & Muneerali, 2019; Muttakin & Subramaniam, 2015). Our results of an insignificant impact in the mature stage of the public life cycle relative to the early stage are not in line with our expectations. There might be several explanations for this result.

The fact that CEO duality is present on average in 46% (Table 3.2) of all observations in our sample indicates that the concept is common, which may explain the insignificant coefficient of the interaction term and may also imply that the negative aspects are less common compared to in other countries. For example, the presence of CEO duality is only 12.5% in a Malaysian study (Sundarasen et al., 2016) and 32.5% in an Indian study (Muttakin and Subramaniam, 2015) where both of the studies find a negative relationship between CEO duality and CSR. Thus, a potential explanation to our insignificant results could therefore be linked to the large presence of CEO duality in our sample where the negative aspects cannot be determined, such as CEOs advancing their own agenda (Villiers et al., 2011), giving lower priority to implement the social agenda (Arayssi et al., 2020) and tend to be associated with lower levels of voluntary disclosures (Gul & Leung, 2004).

Related to the above discussion, the appearance of CEO duality in our sample is reduced in the mature stage compared to the early stage of the public life cycle from 50% to approximately 40%. By speculating, this could be a sign of a founder that is also the CEO and the chairman of the board choosing to leave the company or a result of improved and more rigid governance practices when a firm matures. Thus, the impact from CEO duality is reduced, diminishing the expected increased negative effect over time. That is, the negative impact from CEO duality on ESG is not amplified over the years as a potential result of more mature governance practices and policies, which could indicate that the CEO can have dual seats without additionally affecting the stakeholder management negatively.

## 5.2 Ownership Concentration and ESG

The hypothesis on the ownership concentration dimension (H2) is tested through the sum of the five largest shareholders, the Herfindahl-Hirschman index, and the largest shareholder. The coefficient of the interaction term of the sum of the five largest shareholders is insignificant, not rejecting Hypothesis H2 that ownership concentration has a negative impact on ESG scores in the mature stage relative to the early stage of the public life cycle. The marginal effect in the early stage is further positive and significant, indicating that ownership concentration measured as the sum of the five largest shareholders has a positive impact on ESG scores in the early stage. The results are contrary to our expectations and previous research that finds a negative impact of ownership concentration on CSR (e.g., Dam & Scholtens, 2013; Barnea & Rubin, 2010; Ducassy & Montandrau, 2015; Qa'dan & Suwaidan, 2019).

The coefficient of the interaction term of the second measure Herfindahl-Hirschman index on ownership concentration is negative and significant, indicating that Hypothesis H2 can be rejected and that ownership concentration has a negative impact on ESG scores in the mature stage relative to the early stage of the public life cycle. However, the marginal effect in the early stage, as well as the mature stage, is positive and significant, contrary to our expectations and previous research (e.g., Dam & Scholtens, 2013; Barnea & Rubin, 2010; Ducassy & Montandrau, 2015; Qa'dan & Suwaidan, 2019).

The coefficient of the interaction term of the third measure largest shareholder on ownership concentration is negative and significant, indicating that Hypothesis H2 can be rejected and that ownership concentration has a negative impact on ESG scores in the mature stage relative to the early stage of the public life cycle. The marginal effect in the early stage and the mature stage is further positive and significant, indicating that ownership by the largest shareholder has a positive marginal impact on ESG scores. The marginal effect in the early and mature stage is unexpected and contrary to previous research that suggests that the largest shareholder is reluctant to spend money on CSR activities (Brammer & Pavelin, 2008) and that large owners could be unwilling to engage in CSR activities since it may be interpreted as a provision of a public good privately (Samuelson, 1954) which should promote a negative relationship.

The results of the marginal effects in the early and the mature stage of the public life cycle are surprising since a more concentrated ownership has not been found to have a positive effect on stakeholder management in the majority of previous literature. A potential explanation to why we find a contrary relationship in all three measures on ownership concentration in the early stage may be related to the ideas that Crisóstomo and Freire (2015) present on the importance of having strong majority shareholders with expertise, knowledge, and power that can reduce the information asymmetry between management and the shareholders of the firm in the new public environment where the firm is exposed

to increased stakeholder pressure. That is, reducing the information asymmetry between shareholders and management is an essential factor impacting the management and their stakeholder agenda, especially in the early stage of the public life cycle when information asymmetry is high since the firm has not been quoted before (Arenas-Parra & Álvarez-Otero, 2020). These ideas seem applicable to our study. For example, the largest shareholder in our sample holds on average an ownership stake of 15% (Table 3.2), a substantial part considering that the average share of the sum of the five largest shareholders is 39%. Expecting the largest shareholder to act as a strong force in strategic matters in a firm, reducing information asymmetry between the shareholders and the management, and largely influencing a firm's activities, such as ESG, through their power, could be potential explanations to our results.

After all, the overall results demonstrate that ownership concentration, through the measure Herfindahl-Hirschman index and the largest shareholder, has a relative negative impact over time, in line with our hypothesis, while the marginal effects are positive. By speculating, if we would have been able to extend the length of the sample to include observations in an even more mature stage of the public life cycle, hypothetically more than 15 years since IPO, the question is whether we would exhibit a larger difference in the mature stage relative to the early stage and thus a negative marginal effect in the mature stage. While this is a speculation, one thing that is for sure, however, is that our IPO sample exhibits the opposite marginal relationship compared to other studies, which is an interesting and unexpected finding.

Further, a potential explanation to why the relative impact seen in the interaction term is negative on the Herfindahl-Hirschman index could be related to the fact that when a firm matures, the firm may exhibits the same relative tendencies that previous literature has shown (e.g., Barnea & Rubin, 2010; Ducassy & Montandrau, 2015; Qa'dan & Suwaidan, 2019). For example, majority shareholders are reluctant to invest in a firm's CSR activities. Based on the same idea, several studies (e.g., Ducassy & Montandrau, 2015; Desender & Erupe, 2015) find similar results for the largest shareholder, and it seems reasonable that the relative negative impact from the largest shareholder in our study may derive from the largest shareholder being reluctant to spend money on stakeholder management activities without a clear return on investments in the mature stage of the public life cycle.

The fact that our results in terms of marginal effects in the early and the mature stage differ, compared to both previous literature and our expectations, is interesting and may be related to the IPO setting. By speculating, the appearance of Venture Capital firms (VCs) could be high in IPOs. VCs' ownership pattern is further that they often hold a substantial ownership stake in a firm when performing an IPO and then make an exit after the lock-up period a couple of years after the IPO. Relying on the fact that stakeholder management and, more precisely ESG, is positively related to firm value (Clark et al., 2015)

and that VCs want to maximize firm value before making an exit, then VCs should have an incentive to facilitate the strategic stakeholder agenda to maximize firm value. This could then to some extent explain our results of a positive impact from the largest shareholders on ESG in the early stage.

Further, the relative negative effect in the mature stage could then be explained by the VCs exiting the company. This would imply an assumption that VCs are better in terms of influencing the management and the stakeholder management compared to other large owners. However, this idea is purely based on our speculations but may be interesting to investigate further. Unfortunately, our data do not allow it.

To conclude, our results on ownership concentration and more specifically the measures Herfindahl-Hirschman index and largest shareholder through the interaction indicate that Hypothesis H2 can be rejected. However, the measure on the sum of the five largest shareholders is insignificant, hence not rejecting Hypothesis H2. By combining the results achieved from the broader approach of the ownership concentration of the Herfindahl-Hirschman index measure and the more narrow ownership measure of the largest shareholder, we chose to reject the null hypothesis. Hence, we can conclude that ownership concentration has a negative and significant impact on ESG in the mature stage relative to the early stage of the public life cycle.

# 6. Conclusion

In this study, we make a profound attempt to test how board composition and ownership concentration impact stakeholder management in IPOs over time. By doing so, we complement the research field on stakeholder management and more precisely ESG scores by combining board composition and ownership concentration in one study, in an IPO setting in the US, which previous literature has not done to the best of our knowledge. Our motivation is based on the idea that IPOs commonly result in increased stakeholder pressure in combination with the view that stakeholder management, proxied as ESG score, should be considered a strategic matter for the shareholders of the firm as well as the board of directors. The study takes a quantitative approach and the sample consists of 710 firms that made an IPO between 2005 and 2017 with the aim of answering the following research question: *How does board composition and ownership concentration impact stakeholder management in IPOs over time?*

Our findings demonstrate that independent board members positively influence stakeholder management in IPOs in the mature stage relative to the early stage of the public life cycle. It implies that independent board directors are able to respond to the increased stakeholder pressure even more as the firm ages. Furthermore, we find that CEO duality has an expected negative relative effect in the

early stage and the mature stage, however, the relative impact is not amplified in the mature stage of the public life cycle, contrary to our hypothesis. On the ownership dimension and the measure Herfindahl-Hirschman index and largest shareholder, we find that ownership concentration has a negative impact on stakeholder management in the mature stage of the public life cycle relative to the early stage. However, the marginal effect in the early and mature stage is positive and significant, unexpected and contrary to previous literature. We speculate that these contrary findings are related to the importance of having large owners from a strategic point of view in the new public environment.

Our study contributes to the ESG literature and complements the field by shedding light on ESG scores in an IPO setting and the impact from board composition and ownership concentration over time. Our findings can be seen in the light of how the public environment impacts a firm and their stakeholder management and how an optimal board composition and ownership structure can facilitate the response in the new public environment. Our contribution for practitioners is related to corporate governance mechanisms that drive favorable actions and by that enables an enhanced ESG score. Thus, the findings of our study can aid firms planning to perform an IPO as they can interpret corporate governance mechanisms that can facilitate good stakeholder management and a better ESG score. Furthermore, our results are also relevant for listed firms that seek to improve their ESG score.

A limitation of our study is that the ownership dimension is investigated on an aggregated level, which naturally reveals opportunities to deepen the analysis in future research. As such, we suggest that future research should employ a similar approach and attempt to test if there exist any differences in the type of owner and the nationality of the owner and their impact on stakeholder management, related to our discussion on VC ownership in IPOs. Moreover, the board composition dimension is restricted to a generic personal characteristic level. Future research could further investigate this by including more detailed factors such as education, age, background, and network. This may facilitate a nuanced understanding of what personal characteristics of the directors that are better in responding to an increased stakeholder pressure after an IPO over time. Another suggestion for future research is to investigate potential endogeneity bias further and attempt to find an appropriate instrument variable that controls for this issue, complementing our initial attempt on a 2SLS model. Another limitation of our study relates to the ESG score and the potential ambiguity of the score. Despite the fact that we use a rigid ESG score that is well established with over 450 metrics and used by several other studies, a potential limitation might still be the comparability. That is, the possibility to compare ESG scores across sectors, countries and over time may be questionable due to the nature of the score and the continues development within the field. We have not been able to analyse the extent of this concern, which naturally reveals a final suggestion for future research, to deepen the understanding of how differences in ESG scores across sectors, countries and over time vary and how such a concern should be addressed.

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# Appendix

**Appendix 1**
Screening Procedure

| | *Firms* |
|---|---|
| Global sample | 2056 |
| Keep only US listed firms | -1109 |
| Keep only pure IPOs | -122 |
| Exclude firms with incomplete ownership data | -57 |
| Exlcude REITs | -58 |
| **Final sample of firms** | **710** |

**Appendix 2**
ESG Score Composition & Number of Metrics per Category

| **Enviromental** | | **Social** | | **Governance** | |
|---|---|---|---|---|---|
| Resource use | 20 | Workforce | 30 | Management | 35 |
| Emissions | 28 | Human rights | 8 | Shareholders | 12 |
| Innovation | 20 | Community | 14 | CSR strategy | 9 |
| | | Product responsibility | 10 | | |

**Appendix 3**

Definition of ESG Dimension Categories

| Category | Definition |
|---|---|
| Resource use | The resource use score reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management. |
| Emissions | The emission reduction score measures a company's commitment and effectiveness towards reducing environmental emissions in its production and operational processes. |
| Innovation | The innovation score reflects a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes, or eco-designed products. |
| Workforce | The workforce score measures a company's effectiveness in terms of providing job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities and development opportunities for its workforce. |
| Human rights | The human rights score measures a company's effectiveness in terms of respecting fundamental human rights conventions. |
| Community | The community score measures the company's commitment to being a good citizen, protecting public health and respecting business ethics. |
| Product responsibility | The product responsibility score reflects a company's capacity to produce quality goods and services, integrating the customer's health and safety, integrity and data privacy |
| Management | The management score measures a company's commitment and effectiveness towards following best practice corporate governance principles |
| Shareholders | The shareholders score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices. |
| CSR strategy | The CSR strategy score reflects a company's practices to communicate that it integrates economic (financial), social and environmental dimensions into its day-to-day decision-making processes. |

*Source: Thomson Reuters. (2021). Environmental, Social and Governance (ESG) scores from Refinitiv. Page 22*

**Appendix 4**

Variable Definitions

| | |
|---|---|
| ***Dependent variable*** | |
| esg_score | ESG-score provided by the Refinitv Eikon database for all the available years since the IPO o the company. Index 0-100 where 100 indicates the highest possible score. |
| ***Independent varibles*** | |
| fbm | Female board members, presented as a share of the total number of board members. |
| ibm | Independent board members, presented as a share of the total number of board members. |
| board_size | Board size is the number of board of directors in the firm. |
| ceo_duality | Dummy variable that takes the value of one if the CEO also is the chairman of the firm or if the chairman of the firm has been the CEO of the company, otherwize zero. |
| sum5 | Sum of the five largest shareholders in percentage in terms of ownership of the firm. |
| hhi | Herfindal-Hirschman index, calculated as the sum squared of the 25 largest shareholders, index between 1-100. |
| largest_shareholder | Largest shareholder in percentage in terms of ownership of the firm. |
| mature_dummy | Dummy variable that takes the value of one if the observation is in the mature stage, otherwise zero. Mature is defined as more than five years since IPO. |
| fbmXmature | Interaction term between female board memeber and mature dummy. |
| ibmXmature | Interaction term between independent board memeber and mature dummy. |
| boardsizeXmature | Interaction term between board size and mature dummy. |
| ceodualityXmature | Interaction term between ceo duality and mature dummy. |
| sum5Xmature | Interaction term between sum of the five largest shareholders and mature dummy. |
| hhiXmature | Interaction term between the Herfindal-Hirschman index and mature dummy. |
| largest_shareholderXmature | Interaction term between the largest shareholder and mature dummy. |
| mature_dummy | Dummy variable that takes the value of one if the observation is in the mature stage, otherwise zero. Mature is defined as more than five years since IPO. |
| ***Control variables*** | |
| size | Logarithmic transformation of total assets. |
| roa | Return on total assets ratio measure. |
| leverage | Long term debt divided by total equity. |

**Appendix 5**

Descriptive Statistics Before Outlier Management

| | N | min | p1 | p5 | mean | p50 | p95 | p99 | max | sd | skewness | kurtosis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| esg_score | 2813 | 0.847 | 8.042 | 12.682 | 33.544 | 30.215 | 65.689 | 79.575 | 93.015 | 15.996 | 0.888 | 3.511 |
| fbm | 2813 | 0.000 | 0.000 | 0.000 | 14.521 | 12.500 | 35.714 | 50.000 | 66.667 | 11.644 | 0.716 | 3.545 |
| ibm | 2813 | 0.000 | 25.000 | 42.857 | 74.125 | 77.778 | 90.909 | 92.308 | 100.000 | 16.194 | -1.412 | 5.455 |
| board_size | 2813 | 4.000 | 5.000 | 6.000 | 8.996 | 9.000 | 13.000 | 16.000 | 20.000 | 2.150 | 0.735 | 4.245 |
| ceo_duality | 2813 | 0.000 | 0.000 | 0.000 | 0.461 | 0.000 | 1.000 | 1.000 | 1.000 | 0.499 | 0.158 | 1.025 |
| sum5 | 2813 | 7.428 | 17.976 | 22.629 | 39.309 | 37.212 | 68.551 | 82.534 | 92.488 | 13.171 | 1.216 | 4.837 |
| hhi | 2813 | 0.161 | 1.011 | 1.536 | 6.206 | 4.024 | 22.017 | 47.415 | 72.086 | 8.258 | 4.275 | 24.296 |
| largest_shareholder | 2813 | 2.316 | 4.866 | 6.430 | 15.216 | 11.482 | 43.712 | 68.344 | 84.780 | 12.112 | 2.955 | 12.526 |
| mature_dummy | 2813 | 0.000 | 0.000 | 0.000 | 0.467 | 0.000 | 1.000 | 1.000 | 1.000 | 0.499 | 0.133 | 1.018 |
| roa | 2813 | -1170.610 | -82.129 | -39.014 | -1.505 | 2.479 | 16.838 | 31.576 | 359.738 | 31.726 | -19.078 | 676.523 |
| leverage | 2813 | -776.587 | -10.607 | 0.000 | 0.548 | 0.417 | 4.347 | 20.388 | 143.062 | 18.177 | -30.461 | 1238.989 |
| size | 2813 | -0.390 | 4.365 | 5.126 | 7.761 | 7.742 | 10.801 | 11.882 | 12.332 | 1.679 | 0.158 | 3.038 |

*The table shows the descriptive statistics before outlier management. The min and max value is compared to the 1st and 99th percentile when determining which outliers that should be adjusted.*

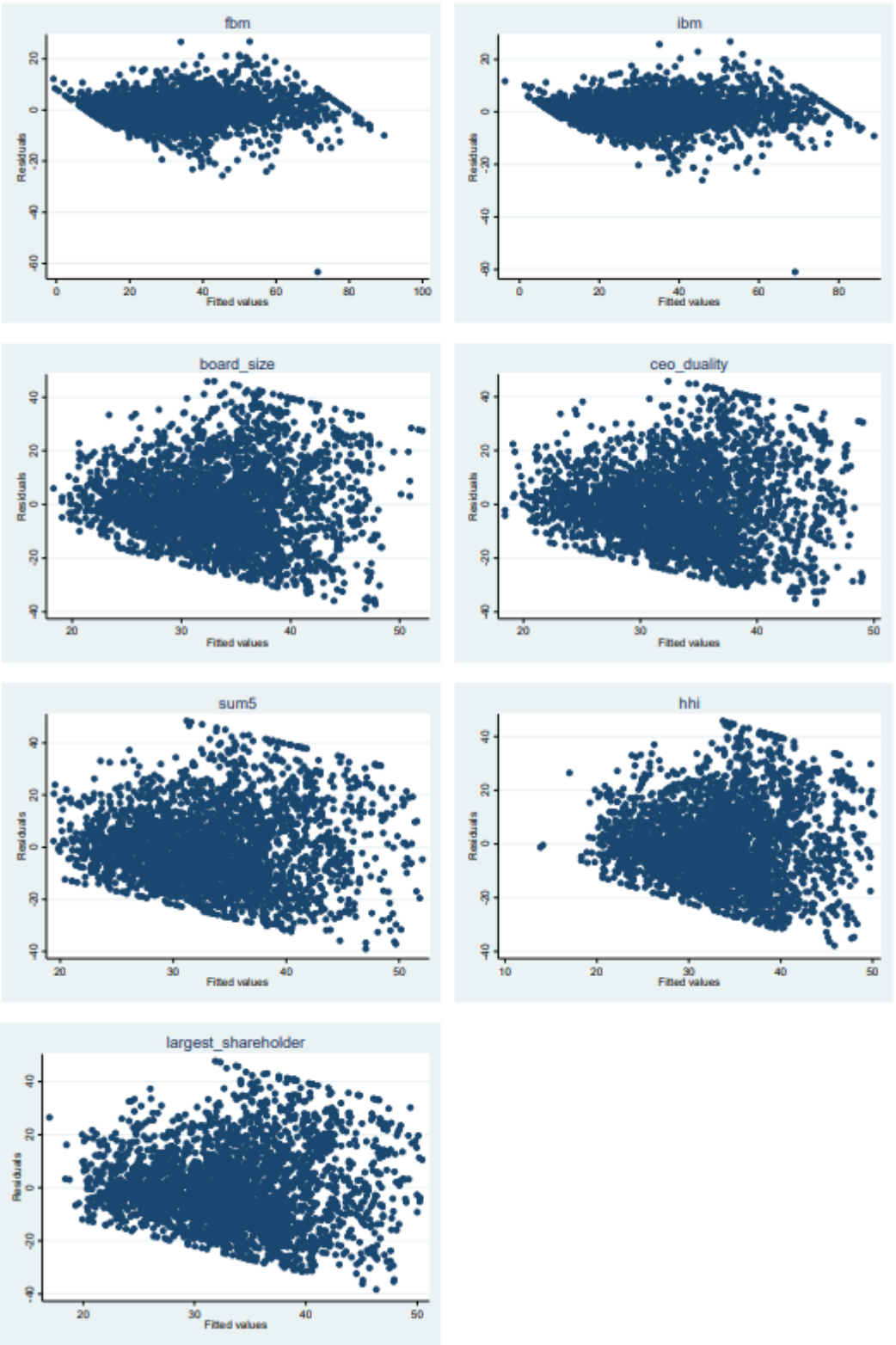
**Appendix 6**

Panel Descriptive Statistics

| Variable | Mean | Std. Dev. | Min | Max | Observations | Variable | Mean | Std. Dev. | Min | Max | Observations |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **esg_score** | | | | | | **hhi** | | | | | |
| overall | 33.503 | 15.783 | 8.042 | 79.575 | N = 2813 | overall | 6.089797 | 7.517249 | 1.0111 | 47.4147 | N = 2813 |
| between | | 13.082 | 8.042 | 79.575 | n = 710 | between | | 6.5712 | 1.0111 | 47.4147 | n = 710 |
| within | | 7.166 | -15.694 | 68.337 | T bar = 3.96197 | within | | 2.720948 | -17.71794 | 42.85601 | T bar = 3.96197 |
| **fbm** | | | | | | **largest_shareholder** | | | | | |
| overall | 14.487 | 11.523 | 0.000 | 50.000 | N = 2813 | overall | 15.1409 | 11.69113 | 4.8655 | 68.3436 | N = 2813 |
| between | | 10.389 | 0.000 | 50.000 | n = 710 | between | | 10.61044 | 4.92155 | 68.3436 | n = 710 |
| within | | 5.281 | -7.676 | 49.055 | T bar = 3.96197 | within | | 4.338489 | -18.79569 | 64.30928 | T bar = 3.96197 |
| **ibm** | | | | | | **mature_dummy** | | | | | |
| overall | 74.264 | 15.560 | 25.000 | 92.308 | N = 2813 | overall | 0.467 | 0.499 | 0.000 | 1.000 | N = 2813 |
| between | | 13.875 | 25.000 | 92.094 | n = 710 | between | | 0.420 | 0.000 | 1.000 | n = 710 |
| within | | 7.049 | 22.834 | 105.268 | T bar = 3.96197 | within | | 0.316 | -0.433 | 1.300 | T bar = 3.96197 |
| **board_size** | | | | | | **roa** | | | | | |
| overall | 8.989 | 2.116 | 5.000 | 16.000 | N = 2813 | overall | -0.793 | 17.227 | -82.129 | 31.576 | N = 2813 |
| between | | 1.916 | 5.000 | 16.000 | n = 710 | between | | 17.951 | -82.129 | 31.035 | n = 710 |
| within | | 0.816 | 3.989 | 12.807 | T bar = 3.96197 | within | | 7.263 | -76.019 | 48.389 | T bar = 3.96197 |
| **ceo_duality** | | | | | | **leverage** | | | | | |
| overall | 0.461 | 0.499 | 0.000 | 1.000 | N = 2813 | overall | 0.953 | 3.051 | -10.607 | 20.388 | N = 2813 |
| between | | 0.472 | 0.000 | 1.000 | n = 710 | between | | 2.161 | -9.426 | 20.388 | n = 710 |
| within | | 0.188 | -0.456 | 1.389 | T bar = 3.96197 | within | | 2.224 | -19.165 | 20.973 | T bar = 3.96197 |
| **sum5** | | | | | | **size** | | | | | |
| overall | 39.307 | 13.004 | 17.976 | 82.534 | N = 2813 | overall | 7.769 | 1.659 | 4.365 | 12.332 | N = 2813 |
| between | | 11.835 | 17.976 | 82.534 | n = 710 | between | | 1.599 | 4.365 | 12.304 | n = 710 |
| within | | 5.430 | 7.831 | 82.584 | T bar = 3.96197 | within | | 0.353 | 3.493 | 9.852 | T bar = 3.96197 |

*The table shows the panel descriptives of the overall, between and within standard deviation, min value and max value. Furhter it shows the number of year observations (N) and the number of firms (n) in the sample. T-bar represents the average number of years observed per each firm. The between statistics is between firms in the sample and the within statistics is within each firm.*

**Appendix 7**
Heteroskedasticity Plots



**Appendix 8**

Main Regression Results with ESGC as Dependent Variable

| VARIABLES | (1) esgc | (2) esgc | (3) esgc | (4) esgc | (5) esgc | (6) esgc | (7) esgc |
|---|---|---|---|---|---|---|---|
| fbm | 0.082* | | | | | | |
| | (1.836) | | | | | | |
| fbmXmature | 0.032 | | | | | | |
| | (0.643) | | | | | | |
| ibm | | 0.108*** | | | | | |
| | | (3.736) | | | | | |
| ibmXmature | | 0.091*** | | | | | |
| | | (3.175) | | | | | |
| board_size | | | -0.296 | | | | |
| | | | (-0.909) | | | | |
| boardsizeXmature | | | 0.416 | | | | |
| | | | (1.350) | | | | |
| ceo_duality | | | | -2.706** | | | |
| | | | | (-2.298) | | | |
| ceodualityXmature | | | | -1.432 | | | |
| | | | | (-1.316) | | | |
| sum5 | | | | | 0.079** | | |
| | | | | | (2.157) | | |
| sum5Xmature | | | | | -0.046 | | |
| | | | | | (-1.230) | | |
| hhi | | | | | | 0.231*** | |
| | | | | | | (3.081) | |
| hhiXmature | | | | | | -0.091** | |
| | | | | | | (-2.115) | |
| largest_shareholder | | | | | | | 0.134*** |
| | | | | | | | (2.846) |
| largest_shareholderXmature | | | | | | | -0.054 |
| | | | | | | | (-1.552) |
| mature_dummy | 0.315 | -6.188*** | -3.074 | 1.400 | 2.471 | 1.157 | 1.474 |
| | (0.318) | (-2.767) | (-1.158) | (1.543) | (1.425) | (1.450) | (1.568) |
| leverage | 0.051 | 0.068 | 0.065 | 0.044 | 0.063 | 0.059 | 0.057 |
| | (0.635) | (0.842) | (0.796) | (0.541) | (0.777) | (0.743) | (0.717) |
| roe | -0.009 | -0.011 | -0.011 | -0.010 | -0.011 | -0.011 | -0.012 |
| | (-0.351) | (-0.385) | (-0.431) | (-0.404) | (-0.423) | (-0.428) | (-0.466) |
| size | 0.364 | 0.366 | 0.289 | 0.234 | 0.284 | 0.421 | 0.391 |
| | (0.503) | (0.530) | (0.400) | (0.327) | (0.395) | (0.584) | (0.547) |
| Constant | 5.701 | 1.877 | 9.113 | 8.009 | 3.089 | 3.922 | 3.387 |
| | (0.862) | (0.298) | (1.221) | (1.167) | (0.437) | (0.561) | (0.492) |
| Observations | 2,812 | 2,812 | 2,812 | 2,812 | 2,812 | 2,812 | 2,812 |
| R-squared | 0.375 | 0.391 | 0.373 | 0.380 | 0.374 | 0.377 | 0.376 |
| Number of id | 710 | 710 | 710 | 710 | 710 | 710 | 710 |
| Year FE/Firm FE | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES |
| Prob > F | | 0 | 0 | 0 | 0 | 0 | 0 |

Robust t-statistics in parentheses

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

*The table shows the results from the main regression model with a life cycle dummy as well as interaction variable. The time variable mature_dummy takes the value of 1 if the observations is more than 5 years since IPO year. R-squared is presented as the within variation. All continuous variables except fbm and size have been winsorized at the 1st and 99th percentile in order to reduce biased results from extreme outliers. The variable fbm is winsorized at the 99th percentile only and the variable size is winsorized at the 1st percentile only.*

**Appendix 9**

Main Regression Results with Mature Stage Defined as More Than 4 Years Since IPO

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| VARIABLES | esg_score | esg_score | esg_score | esg_score | esg_score | esg_score | esg_score |
| fbm | 0.078* | | | | | | |
| | (1.778) | | | | | | |
| fbmXmature | 0.034 | | | | | | |
| | (0.725) | | | | | | |
| ibm | | 0.113*** | | | | | |
| | | (4.067) | | | | | |
| ibmXmature | | 0.086*** | | | | | |
| | | (3.080) | | | | | |
| board_size | | | -0.430 | | | | |
| | | | (-1.302) | | | | |
| boardsizeXmature | | | 0.522* | | | | |
| | | | (1.849) | | | | |
| ceo_duality | | | | -2.759** | | | |
| | | | | (-2.555) | | | |
| ceodualityXmature | | | | -1.507 | | | |
| | | | | (-1.428) | | | |
| sum5 | | | | | 0.104*** | | |
| | | | | | (3.146) | | |
| sum5Xmature | | | | | -0.053 | | |
| | | | | | (-1.333) | | |
| hhi | | | | | | 0.224*** | |
| | | | | | | (4.027) | |
| hhiXmature | | | | | | -0.076 | |
| | | | | | | (-1.320) | |
| largest_shareholder | | | | | | | 0.131*** |
| | | | | | | | (3.468) |
| largest_shareholderXmature | | | | | | | -0.043 |
| | | | | | | | (-0.981) |
| mature_dummy | 1.123 | -5.138** | -3.121 | 2.356*** | 3.705** | 2.023*** | 2.225** |
| | (1.192) | (-2.398) | (-1.255) | (2.934) | (2.091) | (2.649) | (2.293) |
| leverage | 0.098 | 0.112* | 0.116* | 0.088 | 0.109* | 0.106* | 0.104* |
| | (1.623) | (1.837) | (1.890) | (1.473) | (1.821) | (1.771) | (1.729) |
| roa | 0.005 | 0.010 | 0.007 | 0.009 | 0.007 | 0.007 | 0.006 |
| | (0.260) | (0.591) | (0.391) | (0.488) | (0.367) | (0.387) | (0.329) |
| size | 0.994* | 1.015* | 0.883 | 0.837 | 0.900 | 1.026* | 1.005* |
| | (1.744) | (1.812) | (1.490) | (1.472) | (1.520) | (1.735) | (1.702) |
| Constant | 4.670 | 0.481 | 9.689 | 7.263 | 1.283 | 3.116 | 2.494 |
| | (0.598) | (0.064) | (1.145) | (0.904) | (0.153) | (0.374) | (0.302) |
| Observations | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 |
| R-squared | 0.429 | 0.447 | 0.428 | 0.436 | 0.429 | 0.431 | 0.430 |
| Number of id | 710 | 710 | 710 | 710 | 710 | 710 | 710 |
| Year FE/Firm FE | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES |
| Prob > F | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Robust t-statistics in parentheses

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

*The table shows the results from the main regression model with a life cycle dummy as well as interaction variable. The time variable mature_dummy takes the value of 1 if the observations is more than 4 years since IPO year. R-squared is presented as the within variation. All continuous variables except fbm and size have been winsorized at the 1st and 99th percentile in order to reduce biased results from extreme outliers. The variable fbm is winsorized at the 99th percentile only and the variable size is winsorized at the 1st percentile only.*

**Appendix 10**

Main Regression Results with Mature Stage Defined as More Than 6 Years Since IPO

| VARIABLES | (1) esg_score | (2) esg_score | (3) esg_score | (4) esg_score | (5) esg_score | (6) esg_score | (7) esg_score |
|---|---|---|---|---|---|---|---|
| fbm | 0.086** | | | | | | |
| | (2.033) | | | | | | |
| fbmXmature | 0.041 | | | | | | |
| | (0.624) | | | | | | |
| ibm | | 0.125*** | | | | | |
| | | (4.681) | | | | | |
| ibmXmature | | 0.093*** | | | | | |
| | | (3.030) | | | | | |
| board_size | | | -0.247 | | | | |
| | | | (-0.849) | | | | |
| boardsizeXmature | | | 0.417 | | | | |
| | | | (1.353) | | | | |
| ceo_duality | | | | -3.132*** | | | |
| | | | | (-3.035) | | | |
| ceodualityXmature | | | | -1.344 | | | |
| | | | | (-1.023) | | | |
| sum5 | | | | | 0.102*** | | |
| | | | | | (3.205) | | |
| sum5Xmature | | | | | -0.072 | | |
| | | | | | (-1.601) | | |
| hhi | | | | | | 0.254*** | |
| | | | | | | (4.716) | |
| hhiXmature | | | | | | -0.164*** | |
| | | | | | | (-3.229) | |
| largest_shareholder | | | | | | | 0.152*** |
| | | | | | | | (4.281) |
| largest_shareholderXmature | | | | | | | -0.099** |
| | | | | | | | (-2.477) |
| mature_dummy | -0.873 | -7.357*** | -4.244 | 0.156 | 2.228 | 0.414 | 0.948 |
| | (-0.796) | (-3.160) | (-1.489) | (0.189) | (1.205) | (0.542) | (1.028) |
| leverage | 0.095 | 0.116* | 0.107* | 0.089 | 0.107* | 0.104* | 0.100* |
| | (1.597) | (1.922) | (1.718) | (1.505) | (1.795) | (1.740) | (1.678) |
| roa | 0.005 | 0.009 | 0.006 | 0.009 | 0.009 | 0.009 | 0.007 |
| | (0.256) | (0.526) | (0.347) | (0.490) | (0.469) | (0.481) | (0.391) |
| size | 1.065* | 1.008* | 0.991* | 0.908 | 0.956 | 1.092* | 1.076* |
| | (1.881) | (1.772) | (1.651) | (1.542) | (1.573) | (1.794) | (1.772) |
| Constant | 3.084 | -1.295 | 5.881 | 5.504 | -0.329 | 1.302 | 0.543 |
| | (0.389) | (-0.166) | (0.673) | (0.663) | (-0.039) | (0.152) | (0.064) |
| Observations | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 |
| R-squared | 0.426 | 0.445 | 0.424 | 0.432 | 0.426 | 0.431 | 0.429 |
| Number of id | 710 | 710 | 710 | 710 | 710 | 710 | 710 |
| Year FE/Firm FE | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES |
| Prob > F | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Robust t-statistics in parentheses

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

*The table shows the results from the main regression model with a life cycle dummy as well as interaction variable. The time variable mature_dummy takes the value of 1 if the observations is more than 6 years since IPO year. R-squared is presented as the within variation. All continuous variables except fbm and size have been winsorized at the 1st and 99th percentile in order to reduce biased results from extreme outliers. The variable fbm is winsorized at the 99th percentile only and the variable size is winsorized at the 1st percentile only.*

**Appendix 11**

Main Regression Results without Winsorizing

| VARIABLES | (1) esg_score | (2) esg_score | (3) esg_score | (4) esg_score | (5) esg_score | (6) esg_score | (7) esg_score |
|---|---|---|---|---|---|---|---|
| fbm | 0.064 | | | | | | |
| | (1.529) | | | | | | |
| fbmXmature | 0.069 | | | | | | |
| | (1.204) | | | | | | |
| ibm | | 0.114*** | | | | | |
| | | (4.348) | | | | | |
| ibmXmature | | 0.094*** | | | | | |
| | | (3.238) | | | | | |
| board_size | | | -0.348 | | | | |
| | | | (-1.135) | | | | |
| boardsizeXmature | | | 0.528* | | | | |
| | | | (1.714) | | | | |
| ceo_duality | | | | -2.774*** | | | |
| | | | | (-2.584) | | | |
| ceodualityXmature | | | | -1.851 | | | |
| | | | | (-1.614) | | | |
| sum5 | | | | | 0.102*** | | |
| | | | | | (3.149) | | |
| sum5Xmature | | | | | -0.051 | | |
| | | | | | (-1.248) | | |
| hhi | | | | | | 0.231*** | |
| | | | | | | (4.527) | |
| hhiXmature | | | | | | -0.105** | |
| | | | | | | (-2.454) | |
| largest_shareholder | | | | | | | 0.152*** |
| | | | | | | | (4.134) |
| largest_shareholderXmature | | | | | | | -0.070* |
| | | | | | | | (-1.878) |
| mature_dummy | -0.103 | -6.272*** | -4.002 | 1.696** | 2.792 | 1.367* | 1.819* |
| | (-0.095) | (-2.790) | (-1.450) | (2.020) | (1.516) | (1.732) | (1.853) |
| leverage | 0.007** | 0.008** | 0.009** | 0.006 | 0.008** | 0.008** | 0.008** |
| | (1.971) | (2.207) | (2.452) | (1.281) | (2.353) | (2.442) | (2.284) |
| roa | -0.003 | -0.002 | -0.001 | -0.001 | -0.003 | -0.002 | -0.003 |
| | (-0.604) | (-0.354) | (-0.178) | (-0.118) | (-0.550) | (-0.439) | (-0.528) |
| size | 0.963* | 0.870 | 0.813 | 0.731 | 0.792 | 0.939 | 0.922 |
| | (1.732) | (1.570) | (1.382) | (1.285) | (1.338) | (1.588) | (1.559) |
| Constant | 4.966 | 1.327 | 9.191 | 7.742 | 1.794 | 3.425 | 2.552 |
| | (0.657) | (0.182) | (1.112) | (0.995) | (0.224) | (0.427) | (0.320) |
| Observations | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 |
| R-squared | 0.431 | 0.447 | 0.428 | 0.437 | 0.430 | 0.433 | 0.432 |
| Number of id | 710 | 710 | 710 | 710 | 710 | 710 | 710 |
| Year FE/Firm FE | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES |
| Prob > F | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Robust t-statistics in parentheses

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

*The table shows the results from the main regression model with a life cycle dummy as well as interaction variable. The time variable mature_dummy takes the value of 1 if the observations is more than 5 years since IPO year. R-squared is presented as the within variation.*

**Appendix 12**

Second Stage 2SLS Results

| VARIABLES | (1) esg_score | (2) esg_score | (3) esg_score | (4) esg_score | (5) esg_score | (6) esg_score | (7) esg_score |
|---|---|---|---|---|---|---|---|
| IV_fbm | 1.147 | | | | | | |
| | (0.473) | | | | | | |
| IV_fbmXmature | -0.264* | | | | | | |
| | (-1.845) | | | | | | |
| IV_ibm | | 0.648*** | | | | | |
| | | (4.165) | | | | | |
| IV_ibmXmature | | -0.110 | | | | | |
| | | (-1.279) | | | | | |
| IV_boardsize | | | -17.921** | | | | |
| | | | (-2.009) | | | | |
| IV_boardsizeXmature | | | -1.330 | | | | |
| | | | (-0.830) | | | | |
| IV_ceoduality | | | | -15.060 | | | |
| | | | | (-0.693) | | | |
| IV_ceodualityXmature | | | | 6.761 | | | |
| | | | | (0.421) | | | |
| IV_sum5 | | | | | 0.460 | | |
| | | | | | (1.099) | | |
| IV_sum5Xmature | | | | | -0.614 | | |
| | | | | | (-1.265) | | |
| IV_hhi | | | | | | 1.047** | |
| | | | | | | (2.086) | |
| IV_hhiXmature | | | | | | -2.019*** | |
| | | | | | | (-3.092) | |
| IV_largest_shareholder | | | | | | | 0.615* |
| | | | | | | | (1.745) |
| IV_largestshareholderXmature | | | | | | | -1.354*** |
| | | | | | | | (-3.216) |
| mature_dummy | 4.383* | 9.050 | 12.685 | -2.224 | 24.952 | 12.734*** | 21.008*** |
| | (1.861) | (1.443) | (0.884) | (-0.306) | (1.302) | (3.129) | (3.268) |
| leverage | 0.036 | 0.107** | 0.248** | 0.044 | 0.110* | 0.110* | 0.109* |
| | (0.210) | (1.998) | (2.528) | (0.403) | (1.803) | (1.798) | (1.761) |
| roa | -0.029 | 0.007 | -0.072* | 0.007 | 0.005 | 0.005 | 0.005 |
| | (-0.319) | (0.399) | (-1.714) | (0.366) | (0.265) | (0.253) | (0.244) |
| size | 1.037 | 1.273*** | -3.092 | 0.985 | 0.977* | 1.082* | 0.989 |
| | (1.374) | (2.958) | (-1.526) | (1.645) | (1.672) | (1.672) | (1.569) |
| Constant | 3.234 | -25.029*** | 205.052** | 11.114 | -14.435 | -1.041 | -4.262 |
| | (0.374) | (-2.986) | (2.098) | (0.946) | (-0.731) | (-0.109) | (-0.405) |
| Observations | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 | 2,813 |
| R-squared | 0.425 | 0.427 | 0.427 | 0.423 | 0.424 | 0.430 | 0.430 |
| Number of id | 710 | 710 | 710 | 710 | 710 | 710 | 710 |
| Year FE/Firm FE | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES | YES/YES |
| Prob > F | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Robust t-statistics in parentheses

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

*The table shows the results from the second stage of the 2SLS regression. The time variable mature_dummy takes the value of 1 if the observations is more than 5 years since IPO year. R-squared is presented as the within variation. All continuous variables except fbm and size have been winsorized at the 1st and 99th percentile in order to reduce biased results from extreme outliers. The variable fbm is winsorized at the 99th percentile only and the variable size is winsorized at the 1st percentile only. The predicted main variable in each regression is predicted based upon the industry average per year, our choice of instrument, of that variable. Conseqently the interaction term is the interaction of the predicted main variable and mature_dummy.*