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Corporate Governance, Ownership, and Risk Management

PAUL CHARLES PUDSCHEDL

TILBURG UNIVERSITY

Corporate Governance, Ownership, and Risk Management

Proefschrift ter verkrijging van de graad van doctor aan Tilburg University

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Thesis summary

This thesis examines how corporate governance and ownership structures relate to firm ESG performance, disclosure, and the ensuing effects on financial performance and corporate risk management using several unique datasets and diverse methodologies. I consider the effects of stewardship codes and mandatory ESG reporting requirements on ESG disclosure and quality. The preferences for various categories of institutional investors for firm ESG characteristics are examined with relationship to public equities as well as investments in alternative asset classes. I examine the effects of corporate governance and ownership structures on risky firm behavior and then the ensuing market reactions and cost of capital effects in the wake of regulatory fines. Finally, I consider the relationship between corporate governance and risk management in the context of firm captive insurance usage. This thesis contributes to the literature on how ownership structures and corporate governance impact firm ESG disclosure and quality and the linkages between corporate governance and financial performance and risk management.

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For Chapter 2: I appreciate valuable comments and suggestions from an anonymous referee from the Singapore Journal of Legal Studies as well as from conference and seminar participants at the Conference on Corporate Law and Governance at Bocconi University (March 2019), Conference on Stewardship Codes at the European University of Rome (jointly organised with Bocconi University and Consob) (June 2019), ECGI and House of Finance Conference Commemorating Brigitte Haar at Goethe University Frankfurt (September 2019), Conference on Alternative Investments in the Tech Era at the National University of Singapore (September 2019), and the 3CL Travers Smith Seminar Series at Cambridge University (November 2019). I am also grateful to Brian R. Cheffins, Paul L. Davies, Jeffrey N. Gordon, and Giovanni Strampelli for fruitful discussions and comments.

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1 Introduction

There is a large literature on ESG integration into corporate decision making and the investment strategies of institutional investors. Insights from earlier research can be viewed essentially as three related strands. The first strand argues that that most institutional investors take ESG factors into account because they believe them to be linked to financial performance (Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011). The second strand argues that the link between ESG and firms' financial performance is the combined effects of a sufficiently large number of investors acting on nonfinancial motives to slant their portfolios towards firms with strong ESG criteria and away from firms with poorer ESG quality. In these models, the subset of investors acting this way needs to be just large enough to raise the cost of capital for firms with poor ESG quality so that these firms will have a financial incentive to invest in improving ESG quality and, thus, to attract a larger number of investors (Heinkel et al., 2001). The third stand argues that the positive relationship between ESG and financial performance involves considering the risk benefits that may accrue to individual firms due to their ESG characteristics, as well as the diversification benefits related to firms' ESG characteristics. In these studies, improved financial performance depends on how the portfolio manager uses ESG screenings (see, for example, Statman and Glushkov 2009; Barnett and Salomon, 2006; Sherwood and Pollard, 2018; Gibson et al., 2020; Hanson et al., 2017).

While these perspectives have been influential and helpful, several broad issues remain unexplained, and additional questions have been raised. In the midst of increased regulatory interest in standardizing ESG reporting and disclosure in many jurisdictions, as well as continued pressure on institutional investors and companies to focus on ESG, increased research has still left many unanswered and, indeed, underexplored questions: the relationship between ESG and financial performance; the distinction between ESG quality and the disclosure of ESG-related information by firms; the motives of various investors for considering ESG; and the relative importance of the environmental, social, and governance aspects of a firm in attracting various institutional investors and the relevant impact on a firm's financial performance. This dissertation uses new, unique datasets to build upon related prior work and add to the existing literature with a law and finance focus.

I explore how the ESG quality of firms relates to firm performance and differentiate the quality of ESG from the simple disclosure of ESG-related information by firms. I consider how the legal and regulatory environment—vis-à-vis stewardship codes for institutional investors and mandatory ESG reporting requirements for companies and institutional investors—has impacted firms to increase their disclosure of ESG-related data and improve the actual quality of ESG metrics.

I then ask what preferences exist for institutional investors with respect to ESG and the individual E, S, and G pillars. What distinctions in preferences can be made between institutional investors generally and blockholders and very large institutional investors in particular? How do these preferences relate to the financial performance relationship with each of these pillars? In examining these questions, I again consider the distinction between disclosure of ESG information by firms and the actual efforts of firms to improve their ESG quality.

In order to expand the analysis beyond publicly listed securities, I examine the role of ESG in the market for alternative investments using a survey instrument. I again consider relative preferences among E, S, and G, but now ask who drives the interest in ESG in this asset class – LPs or GPs? – and what are their motives. I then consider what investor characteristics determine the level of interest in ESG and the extent to which investors actively integrate ESG criteria into their investment decision-making processes. I also explore how investors engage with portfolio companies with respect to ESG.

My final two chapters ask what role governance plays in protecting firm value, and what role institutional investors, insiders, and blockholders play in this process. I examine whether the interests of very large institutional investors align with the goal of increasing total firm value or whether they more interested in maximizing the private benefits of ownership.

1.1 Central Research Questions

The central research questions of this dissertation can be stated as follows: How do governance and ownership influence companies' decision making with respect to ESG? How do the financial and non-financial motives of different categories of investors compare? And

what roles do explicit regulatory rules, soft law such as stewardship codes, and market-related pressures play?

These central questions can be further broken down into the following research questions examined in each chapter:

1. What effect do ESG disclosure requirements and stewardship codes related to ESG for institutional investors have on companies' ESG quality? How does this relate to financial performance?
2. What is the relationship between a company's E, S, and G quality and ownership structure? What is the relative impact of E, S, and G on a company's financial performance?
3. How do ESG preferences extend into the market for alternative assets? What are the differences in the views and roles of LPs versus GPs with respect to ESG and investments in alternative assets? Do venture capitalists consider ESG differently than private equity investors?
4. How do governance and ownership structure influence corporate decision making to avoid actions that attract regulatory fines, and how can these characteristics affect market reactions to regulatory penalties?

What role do governance and ownership play in corporate decision making with regard to risk management? How do governance- and ownership-related motives compare with financial motives?

1.2 Research Methods

In order to answer these research questions, I employ a variety of qualitative and quantitative analyses.

To examine the effects of stewardship regimes and disclosure rules related to ESG, I consider a sample of countries and analyze the various regulatory approaches they take. This is then coupled with a quantitative analysis using measurements of financial performance, ESG

quality, and ESG disclosure. Control variables are used to mitigate other effects and allow for a cross-country comparison.

While previous papers have used survey instruments to consider why institutional investors consider ESG, no paper has considered the relative preferences of institutional investors for the three components of ESG (E, S, and G). In this dissertation, I use a revealed preferences approach whereby I examine the ownership structure of companies compared to their ESG characteristics. ESG composite and component ratings are used from two different ratings providers: one that measures ESG data disclosure and one that ranks company ESG quality. This method allows for the further comparison of institutional ownership preferences for actual ESG quality versus just the disclosure of ESG data.

Since data on alternative asset holdings are scant, it is necessary to go behind the scenes in order to examine how and why investors in alternative assets consider ESG in their investment decision making. Here, a set of interviews provides the background information, which I then leverage to develop a large-scale survey in order to answer these questions.

In order to determine the relationship between governance, corporate malfeasance and financial market effects, I employ an event study and couple this with data on regulatory fines and corporate governance and ownership characteristics. This allows for an ex-ante and ex-post analysis of how governance and ownership influence corporate risk taking and how the market reacts to regulatory fines for excessive risk taking.

Data on company risk-management practices, particularly with regard to captive insurance usage, are not subject to standardized reporting requirements, thus necessitating the hand-collection of this data from regulatory filings. By collecting these data over a long time period, along with financial data, I am able to consider the long-term effects of governance and ownership on corporate risk management via the motivations and effects of utilizing captive insurance structures.

1.3 Chapter outlines

This introduction proceeds by detailing the specific questions addressed in each chapter and providing an overview of the methodologies employed.

1.3.1 Chapter 2: ESG Performance and Disclosure: A Cross-Country Analysis

Chapter 2 considers the policy initiatives that require corporations to report on corporate sustainability issues and institutional investors to disclose ESG information on their portfolios. I look at the effects of these policies on the quality and level of ESG performance, as well as on the related financial performance. Various national and industry bodies have considered approaches ranging from incorporating ESG into voluntary investor stewardship codes to requiring institutional investors and companies to disclose ESG-related data.

On the one hand, various voluntary comply-or-explain disclosure measures were introduced in some countries in Asia and Europe. In France, the new reporting measures are applied to institutional investors to measure the extent to which ESG issues are integrated into their investment and voting decisions. The main aim of these voluntary measures is to enhance awareness of ESG issues and elaborate best practices for institutional investors.

On the other hand, recent studies have begun to dispute the effectiveness of comply-or-explain reporting of ESG investments that is limited or not directly comparable across jurisdictions (OECD, 2017). In this context, the United Kingdom's Financial Reporting Council has revised its Stewardship Code to integrate ESG issues—including climate change—that institutional investors are expected to consider in their investment, monitoring and voting activities, while ensuring that their investment decisions are aligned with client needs (UK Financial Reporting Council, 2019). The ESG factors have become material for investors to achieve these goals (Khan et al., 2016). As such, this may reflect the new Code's attempt to improve the impacts of business activities on non-financial stakeholders—first, by mitigating negative environmental and social externalities, and second, by possibly mitigating systemic risks by giving institutional investors better information regarding firms' ESG factors and encouraging more active corporate governance engagement with the environmental and social aspects of their investments (Rust, 2019).

But do these sustainability investments have value implications for future financial performance? Two opposing views exist with respect to the relationship between ESG investments and financial performance. One stream of literature has shown a weak or negative correlation with the financial performance of ESG funds (see, for example, Riedl and Smeets, 2017; Renneboog et al., 2008). This view states that one reason for holding inefficient investments could be the investors' utility of holding high-quality ESG investments. Another stream of the literature has found evidence of a positive effect of ESG filters on returns and shows that institutional investors can use ESG characteristics to manage portfolio risk (Auer and Scuhmacher, 2016; Verheyden et al., 2016; Bannier et al., 2019; Hanson et al., 2017).

To address these conflicting views in the context of differing regulatory environments, I analyze the link between ESG disclosure and ESG quality through a cross-country comparison encompassing countries with varying ESG disclosure requirements and stewardship codes. The analysis considers the potential relationship between ESG quality and disclosure and firms' financial performance across these countries.

The results show a strong relationship between the extent of ESG disclosure and the quality of a firm's ESG. This relationship is stronger in countries with weaker ESG disclosure requirements, indicating that companies disclosing more information are able to signal high ESG quality in the absence of mandated disclosure. My findings with respect to financial performance provide statistically significant evidence that ESG is correlated with decreased risk. Again, this link is stronger in jurisdictions in which ESG disclosure requirements are weaker. This relationship can be attributed to the fact that firms are simply disclosing more information, while the actual quality of the firms' ESG factors is less important. Furthermore, largely consistent with most of the prior literature, there appears to be little to no impact on risk-adjusted financial performance due to ESG factors.

Overall, the results in Chapter 2 can be taken as an indication that companies with higher ESG disclose more data; they also provide further evidence on the relationship between sustainability and superior financial performance through decreased risk exposure.

1.3.2 Chapter 3: Institutional Investors and ESG Preferences

There is a large literature on the role that ESG plays in financial performance (see Whelan et al., 2021, for a review). A common explanation for increased investor demand focuses on the non-pecuniary component of investor utility functions (see, for example, Fama and French, 2007; Riedl and Smeets, 2017; Renneboog et al., 2008a, 2008b). According to this literature, higher-rated funds are more successful than lower-rated funds in attracting a flow of funds, but none of the high-sustainability funds outperform low-sustainability funds (Hartzmark and Sussman, 2019). While some articles in this literature have touched on the link between ESG scores and the portfolio construction of institutional investors (see, for example, Gibson et al., 2021), little is known about how the individual E, S and G factors influence investors' portfolio decisions.

I hypothesize that institutional investors might consider ESG in their investment decision-making processes for one of three main reasons. The first reason involves the existence of a subset of investors with a non-pecuniary component in their utility functions, which makes them willing to accept investments with poorer financial performance as long as these investments have positive ESG characteristics (Fama and French, 2007; Riedl and Smeets, 2017; Renneboog et al., 2008a, 2008b). This reason may help explain the empirical results documenting the relative underperformance of ESG mutual funds, as well as the flow of funds into and out of ESG funds as a function of ESG performance (Hartzmark and Sussman, 2019; Renneboog et al., 2008a, 2008b). Given a clientele with such preferences, asset managers could be incentivized to adopt ESG strategies for some or all of their investments. Additional evidence along these lines shows that large-asset managers can increase their total fee revenues more by growing assets under management, which appeal to this clientele, rather than by increasing the value of existing investments (Lewellen and Lewellen, 2022).

The second motive for investors to incorporate ESG into their asset management strategies is a potential relationship between ESG and superior financial performance (Statman and Glushkov, 2008; Barnett and Salomon, 2006; Sherwood and Pollard, 2018; Hanson et al., 2017). Superior financial performance due to ESG quality may be explained by higher costs of capital faced by firms with poor ESG characteristics, if the subset of investors with non-pecuniary utility functions is sufficiently large. If these investors shun poor-performing ESG companies, the remaining set of investors will find it more difficult to diversify investments

in these companies and will demand a higher cost of capital for holding them (Heinkel et al., 2001). The higher cost of capital for companies with poor ESG quality may appeal to activist investors who can earn superior returns by investing in poor ESG companies and pushing them to improve their ESG performance and, consequently, their financial valuations (see Gilson and Gordon, 2013; Christie, 2021; Barko et al., 2018). Related empirical evidence also suggests that improvements in ESG metrics are associated with decreased risk, potentially due to decreased regulatory, litigation, and reputational risks faced by firms with high ESG quality (Shafer and Szado, 2019; Hanson et al., 2017; Hoepner et al., 2019; Bialkowski and Starks, 2016; Albuquerque et al., 2020).

Finally, very large asset managers, such as the Big Three (i.e., State Street, Blackrock, and Vanguard), may prefer investments with high ESG quality as a way to reduce their exposure to systemic risks. Very large asset managers are so well-diversified across industries and the economy as a whole (see, for example, Fichtner et al., 2017) that they are much less exposed to firm-specific risks and, therefore, are motivated to reduce the systemic risks in their portfolios that are associated with ESG factors (e.g., climate risk). This is the argument of systematic stewardship proposed in Gordon (2022).

This chapter employs a unique dataset to examine the revealed preferences of institutional investors for ESG investments by looking at their holdings of US-listed equities. I also examine how ESG scores relate to various financial performance measures. The set of tests also breaks up and analyzes the impact of the E, S and G scores individually. In particular, I am interested in testing the relative impact of governance factors on the strategic asset-allocation decisions of institutional investors, even among US-listed firms. Beyond the impact of investor protection embedded in regulation (La Porta et al., 1997, 1998, 2006, 2014), the literature has established a relationship between superior financial performance and good firm governance characteristics (Gompers et al., 2003; Bebchuck, Cohen, and Wang, 2013). Following previous empirical studies establishing a link between firm-level differences in governance and financial performance, even within the same countries (see Beltratti and Stulz, 2009; Doidge et al., 2006), one could expect firm-level differences in governance to still impact institutional investor holdings and financial performance despite the relatively high level of overall governance among US firms.

In order to measure institutional investors' interest in companies between 2013 and 2018, I derive the holdings data from SEC 13F and 13D/G filings of institutional investors and blockholders of US equities. Using this sample of the number of investors, the portfolio allocation of investors, and the holdings of blockholder investors and the Big Three asset managers (Blackrock, Vanguard, and State Street), I find that most investors have a significant preference for investing in firms with high governance quality. Meanwhile, investors tend to limit portfolio stakes in firms with high environmental scores. A notable exception is found among the Big Three, which invest heavily in firms based on environmental criteria (see, for example, Azar et al., 2021).

This result is consistent with my further findings regarding ESG scores and financial performance. The analyses in this chapter provide strong evidence that governance ratings have the most significant impact on improving the risk-return tradeoff as measured by a security's Sharpe ratio. Higher governance scores are also related to decreased exposure to systematic risk as measured by a security's beta.

Environmental scores, on the other hand, have limited impact on a security's Sharpe ratio or beta; however, the results show a negative relationship between environmental scores and alpha. This is evidence that the securities of firms with high environmental scores are overbought and, therefore, overvalued by the market. This is likely due to the interest of the Big Three in these types of firms, driven by the demand of many mutual fund investors to prioritize non-financial incentives (Riedl and Smeets, 2017; Renneboog et al., 2008a, 2008b) and, consequently, contributing to the underperformance of ESG mutual funds (Renneboog et al., 2008a, 2008b; Hartzmark and Sussman, 2019).

The analyses in Chapter 3 also explore the link between disclosure and quality of ESG information by employing ESG rankings from Bloomberg and Sustainalytics. The Bloomberg ESG ratings are disclosure-based, measuring simply the amount of ESG data that companies disclose, while Sustainalytics ranks the actual quality of companies based on their ESG data. Both rating agencies provide a composite ESG ranking, as well as component rankings for the E, S, and G subcategories. By using all component rankings, my analysis considers investor preferences for ESG, as well as the relative preferences among the three components of ESG. And using the Bloomberg and Sustainalytics ratings allows me to compare investor preferences for ESG disclosure to ESG quality.

The results provide two main points of evidence that the governance dimension of ESG has the highest impact on investor holdings, and the Bloomberg disclosure score has a higher impact than the Sustainalytics quality ranking. The results show that institutional investors, overall, are strongly driven by the ESG quality of companies—and particularly by the quality of the governance dimension—when deciding which companies to add to their portfolios. Blockholders, however, seem much less motivated by ESG. These findings generally support the theoretical argument that the vast majority of long-term passive investments by institutional investors are driven disproportionately by ESG over other financial data when simply selecting companies to add to a portfolio; however, investors taking large ownership stakes and activist investors are much less concerned with ESG.

Chapter 3 then examines the relationship between the individual ESG components and financial performance to provide evidence on whether institutional investors are overweighting ESG data due to the potential relationship of these data with financial performance. The chapter presents evidence that ESG is related to decreased risk and a more favorable risk-return tradeoff. These results are most significant for the governance score. There is evidence that higher environmental scores are related to overpriced securities. While the evidence is consistent with the prior literature on the portfolio optimization benefits of ESG, the findings in this regard do not explain institutional investors' strong preference for companies with high ESG scores when controlling for other financial characteristics. Further, the data indicate that a large proportion of institutional investors are driven by ESG when deciding whether or not to invest in a company and how much of their portfolio to allocate to the company.

The evidence suggests that the Bloomberg disclosure ratings are more strongly correlated with increased financial performance than are the subjective Sustainalytics quality ratings. The evidence also shows that better governance scores have the highest correlation with better Sharpe ratios and lower betas. The findings of this chapter highlight, among other things, that disclosure ratings tend to be more significant than subjective quality ratings due to the importance of the amount of the information disclosed along each ESG dimension. Furthermore, as there is evidence of a negative relationship between the size of the ownership stake and ESG, companies underperforming with respect to ESG are also underperforming

financially. Thus, it appears that these companies are potentially attractive to activist investors who are willing to take larger stakes in underperforming companies.

My findings make three overarching contributions to the literature. First, they contribute to the literature focusing on the role of ESG issues for the investment decisions of institutional investors (Barko et al., 2018; Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011; Hanson et al., 2017; Gibson et al., 2021).

Second, my findings in this chapter contribute to the body of literature examining the effects of ESG disclosure. Prior evidence on the value-added role of ESG disclosure has typically been related to the positive effects on financial performance. Consequently, it relies on examining the extent of the different types of ESG disclosure as opposed to the actual ESG quality of the investment. The results in this chapter are consistent with the findings that the largest institutional investors are seldom supportive of shareholder proposals related to E and S, as suggested by Griffin (2020), and they help shed light by showing that, as the size of the ownership stake increases, investors care much less about ESG quality.

Third, the results are related to the literature examining the role that composite ESG scores and individual E, S, and G subdimensions play in the financial performance of companies around the world. Prior evidence on the influence of ESG scores and the individual effects of the E, S, and G subfactors on the financial performance of multinational firms in Latin America can be found in Duque-Grisales and Aguilera-Caracuel (2019). This chapter contributes to these studies by using secondary data, rather than a global index, to study the effects of the individual E, S, and G dimensions on US companies. Additionally, Kotsantonis and Serafeim (2019) illustrate the difficulty in constructing consistent ESG ratings. Gibson et al. (2019) attribute differences in ESG ratings subfactors to the legal origins of the countries in which ratings providers are based, and Eccles and Stroehle (2018) argue that differences are inherent in the mission and goals of the ratings provider. Chapter 3 contributes to this strand of the literature by analyzing ownership and financial performance with respect to ESG composite and ESG components.

1.3.3 Chapter 4: Institutional Investors, Alternative Asset Managers, and ESG Preferences

Despite the strong growth in ESG integration across investor types, many institutional investors still choose to integrate one or two of the factors or have yet to consider ESG factors at all in their asset allocation process (OECD, 2020). Moreover, while articles in this literature have focused on the ESG fund segment generally (see, for example, Amell-Zadeh and Serafeim, 2017; Hanson et al., 2017; Gibson et al., 2020; and Eccles et al., 2011), relatively little is known about ESG integration in private markets. And while much of the literature considers the implications of climate risk for investors (see, for example, Krueger et al., 2019; Bolton et al., 2022; Sautner et al., 2022; Goldstein et al., 2022), comparison between the E, S, and G factors for investors remains underexplored. Chapter 3 does consider these relative preferences for institutional investors in publicly traded securities using a revealed preferences methodology, and Chapter 4 extends that analysis to private markets using a survey instrument. Distinctions are also made between the motivations and uses of ESG for limited partners (LPs) and general partners (GPs), as well as between private equity (PE) and venture capital (VC) funds.

In order to shed light on these issues, I study the effect of institutional investors' perceived importance of ESG factors with regard to their investments in private equity (PE) and venture capital (VC). I also examine the factors that influence alternative asset managers to incorporate ECG factors into their portfolio allocations. In order to empirically study these questions, I introduce a new dataset from a survey of institutional investors conducted in 2020. The survey data comprised information from 106 UK, European and North American institutions, as well as from a small percentage of respondents around the world who are currently investing in private equity and venture capital. In the survey, investors are asked about their motivations for considering ESG factors; the relative importance of ESG criteria; their use in relation to risk and return considerations; how often they consider ESG criteria and in which stages of the portfolio management process; and for which screening or evaluative purposes ESG criteria are employed.

To gauge the barriers and motives to ESG integration, I examine the reasons that different types of investors consider ESG integration into their investment process. I also evaluate investors' views on the barriers to ESG usage in the investment asset management process.

The survey results indicate that the absence of accurate data and weak comparability of data are the most important hurdles to implementation of ESG criteria.

Considering the different views of LPs and GPs, I ask about the motivations that would influence each group of investors to adopt ESG factors into their investment decision processes. The distinction between GPs and LPs also helps to proxy for the degree of control over portfolio companies. Although GPs recognize the correlations with financial performance, they are more motivated to respond to clients' demands (i.e., demand from LPs). Not surprisingly, I find that LPs are more motivated by the belief that there are correlations with investment risk generally. I also find that GPs integrate ESG factors into their investment strategies in response to increased client demand for sustainable products.

I distinguish between private equity (PE) and venture capital (VC) investment funds in order to proxy for the average age of portfolio companies and the added risk and uncertainty that accompany investments in earlier-stage companies. I find that PE firms use ESG factors more intensely than venture capital VC funds, regardless of geography. Moreover, I find that PE firms use voice and exit strategies more extensively than VC funds in efforts to promote ESG activities in companies.

Next, I study the complementary use of voice and exit strategies by PE and VC firms to manage their ESG issues with companies. I document that GPs use exit and voice more often than LPs. While my interview evidence confirms that LPs will address ESG concerns about a particular company with a GP, this is only for egregious concerns. My findings highlight, among other things, that LPs do not have the same significant effect on governance that GPs have.

I also study investors' views on the relative importance of E, S and G scores individually. It is well known that institutional investors are increasingly implementing ESG scores into their portfolio management activities (Barko et al., 2021; Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011; Hanson et al., 2017; Dyck et al., 2017). Surprisingly, the relationships among the three ESG components have not been explored in the literature until recently. I find that investors, when evaluating individual components of ESG scores, consider the governance score the most important component, followed by E and then S.

1.3.4 Chapter 5: Corporate Governance and Value Preservation: The Effect of the FinCEN Leak on Banks

In this chapter, I examine the effect of governance on the risk-taking behavior of financial institutions and explore how governance can mitigate market reactions and the reputational costs incurred by firms. I use an event study methodology to provide evidence on the market reaction to the FinCEN leaks and the announcement of regulatory penalties for financial and banking-related offenses. Then, I regress on the abnormal returns in order to examine the mitigating effect that governance has on a firm's market reaction to the fine announcements. In order to match this *ex post* analysis, I consider the *ex ante* influence of governance on a firm's risk-taking behavior, as measured by the total annual fines levied against the firm. Finally, I compare the impact of fines on a firm's cost of capital while also considering the mitigating role of governance.

In examining whether regulatory fines imposed on financial institutions can have a negative impact on market valuations, my analysis involves examining how abnormal returns around the imposition of regulatory fines are impacted by governance characteristics related to the board of directors, executive compensation and ownership characteristics, and third-party rankings of firm governance. I also consider the effect that these governance characteristics have on the amount of fines levied on banks. My results provide evidence that banks and financial institutions with better governance are more likely to have fewer regulatory fines and, thus, suffer less financial market effects from the announcements of fines.

Chapter 5 also examines institutional holdings characteristics and their relationship with fines incurred and the firm's cost of capital. This relationship was not explored in the literature until very recently (Shivam and Muckley, 2022). My analysis provides evidence suggesting that institutional investors diversify holdings away from banks with larger fines. These findings generally support the theoretical argument that the cost of capital is impacted as investors eschew more offending firms.

Chapter 5 makes several key contributions to the literature. First, the results help to explain the effect of shareholder holdings and governance on the magnitude of regulatory fines and

market reactions to announcements of financial penalties. Other studies have suggested that weak governance is associated with more enforcement actions, but most of these studies have been limited in scope (see, for example, Beasley, 1996; Agrawal and Chadha, 2005). Second, the results contribute to a growing literature that measures the extent to which financial penalties affect corporate decisions and investments. Finally, by considering the stock price responses to announcements of regulatory fines, this chapter contributes to the literature that stresses the impact of better governance on lower penalties and more-muted market reactions to imposed penalties. The results for large institutional investors diversifying away from more-offending firms not only provides evidence on the cost of capital, but also contributes to the growing literature on reputational risks (Karpoff et al., 2008a, 2008b; Graham et al., 2008; Chava et al., 2018).

1.3.5 Chapter 6: Financial and Governance Aspects as Drivers of Captive Insurance Usage

In Chapter 6, I examine the role of governance and ownership structures as the motivation—versus financial motivations—for creating captive insurance structures. Captive insurance is a risk- management tool used by firms of all sizes and across all industries. A captive is a wholly-owned subsidiary insurance company created by a parent company to pool or finance its own risks. Existing research has focused mainly on the role of captives as a risk-sharing arrangement for large firms. As a result, little is known about the impact of captive usage on financial performance. Moreover, although larger firms are more likely to create an important fraction of insurance captives, the extent to which the use of captives is associated with a firm's insider holdings and holdings by institutional blockholders has not been previously explored.

Theory suggests that, under perfect market conditions, firms would not engage in insurance transactions or hedging because the costs involved would erode firm value. However, the literature on corporate hedging suggests that, because of market imperfections, insurance and hedging activities by firms can have a positive financial impact (Froot et al., 1993; Aretz and Bartram, 2010). Prior studies find that by decreasing the volatility of cash flows over time, hedging has been shown to lower a firm's costs of financial distress, thereby allowing it to access credit markets more cheaply. Also due to the reduction in the volatility of a firm's

profits and losses over time, hedging has been shown to help firms lower their effective tax rates (Smith and Stultz, 1985). Thanks to the decreased variability in earnings, hedging also enables firms to increase expenditures on dividends and investments.

A second explanation for hedging and insurance usage involves aspects of corporate governance. A firm with a concentrated number of large investors is incentivized to push the firm to engage in hedging and insurance activities, as it is cheaper for the firm to hedge these risks than it is for individual investors who have large exposures to the firm, even though most shareholders with smaller stakes in the firm would find it cheaper to diversify such risks through portfolio diversification (Main, 1982). Similarly, in a firm in which executives are largely invested in the firm (in terms of insider shareholdings and stock and option compensation), these executives are incentivized to hedge and insure the assets they hold in the firm through firm-wide hedging and insurance activities, as they may not be able to diversify such risks through portfolio diversification if a large portion of their assets are tied-up in firm securities. Hedging and insurance activities also matter for firms with large shareholdings by passive institutional investors. Indeed, since there is likely to be less of a check on management activity, management may view it as being in their best interest to engage in captive insurance usage in order to provide greater financial stability and, consequently, employment stability—especially if one considers that management's human capital is invested in the firm.

Two opposing views can be distinguished with respect to the relation between firms and the use of captive arrangements. The first holds that the tax deductibility that captive insurers enjoy plays a role in how firms choose their risk-management strategies. This view is based on a large literature suggesting that the benefit of income taxation is a key factor in why firms establish captive insurance structures (Cross et al., 1988; Han and Lai, 1991; Lai and Witt, 1995; Porat and Powers, 1995; Scordis and Porat, 1998). Conversely, the second view holds that financial issues explain the formation of a captive insurance subsidiary by larger firms. This view holds that the use of the captives helps to promote the firm value of the non-insurance parent corporation (Chang and Chen, 2018; Scordis et al., 2007).

To address these two views, I analyze the financial effects of captive insurance usage and the connection with the corporate governance characteristics of firms using captive insurance structures. To examine whether captive insurance usage will yield similar benefits as

hedging, I use a panel data set consisting of annual financial data of US-listed non-financial corporations with securities registered with the SEC over the period 2009-2016 to explain the usage of captive insurance structures by non-financial firms and the impact on firms' financials. The annual financial data are supplemented by evidence of captive insurance usage gleaned from keyword searches and subsequent manual screening of SEC filings for all the firms in the data set. I screen financial filings dated back to 1994 in order to find any potential earlier mentions of captive insurance usage.

As there is no comprehensive database of governance measures for analyzing the firm's captive insurance usage, my analyses in Chapter 6 take a three-prong approach. First, I examine the relationship between firms' captive insurance usage and firms' financial characteristics over time and identify their statistically significant effects on borrowing costs, effective marginal tax rates, and expenditures on dividends and investments. Second, I examine the relationship between insider and institutional investor holdings data, as well executive compensation data, in order to compare governance aspects of firms that do and do not use captive insurance structures. Third, I compare the relative power of financial versus corporate governance motives through a comparison of the econometric models.

Consistent with my hypotheses, I find that captive insurance usage decreases the costs of financial distress and decreases the marginal tax rates faced by firms. These firms are also able to commit more to consistently higher dividend payouts and higher investments in intangible asset development. These results are shown by comparing firms using and not using captive structures and for firms before and after the implementation of captive insurance structures; indeed, the results continue to improve over time for firms adopting such structures. Analysis of executive compensation data shows, as predicted, that greater absolute levels of executive compensation, as well as higher proportions of stock-based compensation, are correlated with a higher likelihood of captive insurance usage, while higher proportions of options-based compensation are related to a lower likelihood of captive insurance usage. This is consistent with the relationship between compensation and hedging found in prior literature (see, for example, Tufano, 1996; Geczy et al., 1997; and Knopf et al., 2002).

Another factor reinforcing the use of captive insurance usage is holdings by insiders and large shareholders. Models including holdings data show that, as predicted, higher levels of

insider holdings are also strongly correlated with captive insurance usage. While there are competing hypotheses related to the role of institutional blockholders (Barclay and Holderness,1989; Shleifer and Vishny, 1986; Black, 1990; Karpoff et al.,1996; Agrawal and Knoeber, 1996; Huddart, 1993; Maug, 1998), the results presented in this chapter suggest that such holdings are related to higher likelihoods of captive insurance usage, though the strength of this relationship is weaker than other governance and ownership variables. Finally, comparisons across financial and governance models show a stronger relationship between governance variables and captive insurance usage, indicating that governance considerations dominate financial ones.

The analysis presented in Chapter 6 makes the following contributions to the literature. First, it contributes to the literature on risk management by showing that captive insurance and hedging have similar effects on addressing risk (see, for example, Mayers and Smith, 1990; Yamori, 1999; Hoyt and Khang, 2000; Adams and Buckle, 2003; Zou and Adams, 2008; Regan and Hur, 2007; Picard and Pinquet, 2011). Moreover, this chapter is also related to the literature on the role of risk-management strategies in reducing R&D risk (Geczy, Minton, and Schrand, 1997; Lewent and Kearney, 1990). My findings confirm the predictions made in the theoretical literature on corporate risk management, hedging, and insurance usage and are consistent with the empirical studies on the effects of hedging. Similarly, the results related to captive insurance and governance are largely consistent with predictions based on the prior theoretical and empirical literature on hedging and governance. Furthermore, by investigating the link between corporate governance and financial implications of hedging, this chapter links the previous strands of the literature exploring governance and the financial motives of hedging (Froot et al., 1993; Lessaerd, 1990; Smith and Stulz, 1985).

2 ESG Performance and Disclosure: A Cross-Country Analysis

Abstract

We use a unique dataset to examine the link between environmental, social and governance ("ESG") disclosure and quality through a cross-country comparison of disclosure requirements and stewardship codes. We find a strong relationship between the extent of ESG disclosure and the quality of a firm's disclosure. Furthermore, we find that ESG is correlated with decreased risk. This result suggests that firms with good ESG scores are simply disclosing more information. Finally, we show that ESG scores have little or no impact on risk-adjusted financial performance.

2.1 Introduction

Corporate sustainability represents a growing concern for both institutional investors and regulators because of the significance of ESG factors in investment decisions and future portfolio performance. This coincides with major changes in the pattern of investments around the world. For example, the growth rate of sustainable investments under management in the United States ("US") increased from USD 8.7 trillion to USD 12 trillion between 2016 and 2018 (US SIF, 2018). Similarly, the impact of the growth of US and European-oriented ESG funds increased by 44% between 2014 and 2018 (Morningstar, 2019). Despite the recent slowdown of investment flows in 2018, ESG-oriented funds are expected to continue growing their assets under management and also to allocate their flows to different types of investment options (Nauman, 2019).

In response to the rapid increase in ESG investments, a policy debate has emerged about whether to introduce mandatory corporate reporting on corporate sustainability issues. Until recently, various national and industry bodies have considered approaches ranging from incorporating ESG into voluntary investor stewardship codes to requiring institutional investors and companies to disclose ESG-related data. On the one hand, various voluntary comply-or-explain disclosure measures were introduced in some countries in Asia and Europe. In France, the new reporting measures are applied to institutional investors to measure the extent to which ESG issues are integrated in their investment and voting decisions. The main aim of these voluntary measures is to enhance awareness of ESG issues

and elaborate best practices for institutional investors. On the other hand, recent studies have begun to dispute the effectiveness of comply-or-explain reporting of ESG investments that is limited or not directly comparable across jurisdictions (OECD, 2017). In this context, the United Kingdom's ("UK") Financial Reporting Council ("FRC") has revised its Stewardship Code to integrate ESG issues—including climate change—that institutional investors are expected to consider in their investment, monitoring and voting activities, while ensuring that their investment decisions are aligned with client needs (UK Financial Reporting Council, 2019; Flood, 2019). To achieve these goals, the ESG factors have become material for investors (see for example Khan et al., 2016). As such, this may reflect the new Code's attempt to improve the impacts of business activities on non-financial stakeholders—first, by mitigating negative environmental and social externalities, and second, by possibly mitigating systemic risks by giving institutional investors better information regarding firm ESG factors and encouraging more active corporate governance engagement with the environmental and social aspects of their investments (Rust, 2019).

But do these sustainability investments have value implications for future financial performance? Two opposing views exist with respect to the relationship between ESG investments and financial performance. One stream of literature has shown a weak or negative correlation with the financial performance of ESG funds (Riedl and Smeets, 2017; Renneboog et al., 2008). This view states that one reason for holding inefficient investments could be the investors' utility of holding high-quality ESG investments. Interestingly, some recent studies have found evidence of a positive effect of ESG filters on returns (Auer and Scuhmacher, 2016; Verheyden et al., 2016). However, other research shows that institutional investors can use increasing ESG scores to manage portfolio risk, particularly in more volatile capital markets such as that of the US (Bannier et al., 2019; Hanson et al., 2017).

To address these conflicting views, we analyse the link between ESG disclosure and the ESG quality through a cross-country comparison encompassing countries with varying ESG disclosure requirements and stewardship codes. Our analysis considers the potential relationship between ESG and firms' financial performance across these countries.

Our results show a strong relationship between the extent of ESG disclosure and the quality of a firm's ESG. The results provide statistically significant evidence that ESG is correlated with decreased risk. However, most of this relationship can be attributed to the fact that firms

are simply disclosing more information, while the actual quality of the firms' ESG factors is of less importance. Furthermore, there appears to be little to no impact on risk-adjusted financial performance due to ESG factors. Overall, our results can be taken as an indication that companies with higher ESG disclose more data; they also provide further evidence on the relationship between sustainability and superior financial performance.

The remainder of the chapter proceeds as follows. Section 2 reviews the relevant literature on ESG disclosure requirements and investment performance. Section 3 discusses the methodology and data. Section 4 examines the relationship between ESG disclosure and a company's ESG metrics, as well as investment performance volatility and risk-adjusted returns. Section 5 concludes.

2.2 Background and literature review

With the increased interest of institutional investors in integrating ESG factors into their asset allocations, asset managers must consider how mandatory ESG disclosure requirements for companies or ESG-related stewardship codes for investors can improve overall ESG quality, as well as what the corresponding impact on firms' financial performance will be.

The existing literature found mixed evidence that, under certain conditions, environmental, social, and governance criteria are individually correlated with firms' positive financial performance; however, the literature on ESG-focused mutual fund performance has shown that ESG funds tend to underperform the market. Other studies have argued that ESG criteria can be used as part of the portfolio design for superior risk-adjusted returns under certain circumstances.

This section begins with a brief overview of recent trends in ESG-related disclosure rules and stewardship codes. This has motivated our research questions regarding the relationship between a firm's level of ESG data disclosure and the quality of ESG, as well as whether ESG disclosure and quality have an impact on firms' financial performance. We then discuss the difficulty in measuring and comparing ESG data between firms. In the third part of this section, we provide a review of the relevant theoretical and empirical literature on ESG factors and financial performance.

2.2.1 ESG Disclosure Requirements and Stewardship Codes

We begin by providing a brief overview of the varying disclosure requirements and stewardship codes in relation to ESG. We consider a range of such regimes from non-mandatory disclosure with no effective stewardship code in the US, mandated disclosure requirements in France, the UK situation of a voluntary stewardship code with a comply-or-explain provision which was developed and continues to evolve through an iterative dialogue between regulators and investors, and "transplanted" stewardship codes in Australia and Japan.

The United Nations ("UN") Principles for Responsible Investment ("PRI") has spearheaded global efforts for investors to incorporate ESG into investment decisions and actively consider the ESG components of their investments. In addition to supporting companies' positive social and environmental impact, the PRI is also aimed at fostering long-term value creation and reducing systemic market risk.[1] In addition to this global, investor-led approach, various national and advisory bodies have considered approaches ranging from incorporating ESG into voluntary investor stewardship codes to requiring institutional investors and companies to disclose ESG-related data.

In the US, companies' ESG statistics are generally deemed material and such statistics are subject to mandatory disclosure only if there is a clear financial consideration. For example, the Securities Exchange Commission ("SEC") Guidance on Climate Change Disclosure states that such data should be disclosed if they relate to a company's "financial condition, liquidity and capital resources, changes in financial condition and results of operations" (SEC, 2010). There have been some increased efforts to get the SEC to adopt widespread mandatory and standardised disclosure requirements related to ESG information (Fisch, 2019; Christensen et al., 2019). Many large institutional investors, academics, lawyers, and proxy advisors backed a rulemaking petition to the SEC (SEC, 2018); however, the US House of Representatives Financial Services Committee roundly rejected legislative proposals to require widespread ESG disclosure by companies.[2] Meanwhile, a new bill was

[1] See UN Principles for Responsible Investing, https://www.unpri.org/.
[2] See Patrick Temple-West, "US Congress rejects European-style ESG reporting standards," Financial Times (12 July 2019); and US House Committee on Financial Services, "Building a Sustainable and Competitive

recently passed by the Financial Services Committee that, if passed by the House, would require public corporations to disclose ESG information in their proxy statements (H.R. 4329/2019; Kaplow, 2019).

In the European Union ("EU"), the materiality threshold for ESG disclosures is not necessarily linked to financial considerations, and a company should report any ESG data that are "necessary for an understanding of the development, performance, position and impact of its activity" (EU Directive 2014/95/EU). As expected, a number of countries have implemented different reporting criteria. For example, in the UK, the Companies Act 2006 was amended after the EU directive to require the disclosure of ESG-related data; Italy not only implemented this EU directive (*vis-á-vis* Italy D.Lgs. 254/2016) which requires ESG data disclosure as of 2017 for medium- and large-cap issuers (more than EUR 20M in assets or EUR 40M in net sales), but also introduced criteria to distinguish the degree of detailed reporting required based on the type of entity.

Stewardship codes are another approach designed to increase the consideration of ESG criteria by institutional investors. There is some evidence that this can drive improved ESG quality. Dyck et al (2019) demonstrate that demand by institutional investors for high-quality ESG investments is correlated with increased ESG performance of firms whose equities are held by large institutional investors.

To cite one example, a 2016 French law requires institutional investors to report how they consider the environmental and social governance issues related to their portfolio companies. Article 173-VI of the French "Energy Transition for Green Growth" law, dated January 2016, requires investors to provide a general description of their ESG policies, to describe how they analyse ESG data, and to explain how such measures are incorporated into their investment and risk-management analyses (see also PRI, 2016; FIR 2016).

Economy: An Examination of Proposals to Improve Environmental, Social and Governance Disclosures" (US House Committee on Financial Services, 10 July 2019), https://financialservices.house.gov/calendar/eventsingle.aspx?EventID=404000. Meanwhile, a bill, H.R. 4329, the ESG Simplification Act of 2019, was passed by the House Financial Services Committee on 20 September 2019, but is unlikely to be passed by the US House of Representatives. See Stuart Kaplow, "ESG Disclosure Simplification Act Passes Committee But Will Fail" LexBlog (13 October 2019), https://www.lexblog.com/2019/10/13/esg-disclosure-simplification-act-passes-committee-but-will-fail/.

Short of the explicit legal requirement of the French law, the UK stewardship code has a comply-or-explain provision that aims to pressure investors into voluntarily disclosing how they consider the ESG aspects of their investments (FRC, 2012). As opposed to a directly legislated approach, the UK FRC in conjunction with the UK Financial Conduct Authority ("FCA") has developed its stewardship code through an iterative discussion and comment process with investors, companies and other stakeholders. The FRC has, in October 2019, finalised a new, expanded stewardship code to include a wider definition of ESG and to broaden the duty of institutional investors beyond their holdings in listed companies to include their holdings in private equity, venture capital, and other alternative investments (FRC, 2019; Flood, 2019).

Australia has ostensibly developed its stewardship code through an iterative dialogue between regulatory bodies and investors. While the process echoes the UK approach, the final product is rather like a transplant of the UK stewardship code—voluntary in nature with a comply-or-explain approach (ACSI, 2018). Australia is even proposing amendments to its stewardship code, and these proposed amendments are almost identical to what the UK has recently done (ACSI, 2019). Japan has followed a similar approach of "transplanting" the UK's iterative, voluntary stewardship code with a similar comply-or-explain approach (FSA, 2017). The high degree of cross-shareholdings among Japanese companies and the large ownership stake of Japanese banks mean that there is a significant number of investors not covered by the UK-style stewardship code in Japan; this limits the overall impact of the Japanese stewardship code (Nakagawa, 2017).

Aside from stewardship codes and mandated ESG disclosure requirements, there is evidence that a more market-based approach may bring about results that would improve both ESG quality and firms' financial performance. Barko et al (2018) examine how ESG-mandated activist funds that focus on improving target company ESG criteria can also improve the target companies' financial performance. They find minimal but statistically significant evidence of positive reactions to stock prices after engagement. Yet it is not clear if this is due to the investor engaging in ESG criteria, since the effects on accounting and fundamental financial measures are statistically insignificant. In short, it may simply be that this fund is also good at finding firms with undervalued equities in addition to driving ESG improvement at these companies. So how, then, can investors keep an effective yardstick measure of the ESG data that companies disclose? We highlight several approaches in the next section.

2.2.2 ESG Indices and Rankings

This section discusses standards for calculating and reporting ESG data, as well as efforts by data providers to compose ESG rankings and ratings.

There are various competing standards for how companies should disclose raw ESG data. The Global Reporting Initiative ("GRI") is a UN-affiliated organisation ("UNEP") that has created "Sustainability Reporting Standards"—guidelines for reporting ESG data.[3] The US-based Sustainability Accounting Standards Board ("SASB") has issued 77 industry-specific standards modelled after such standards, and these 77 industry-specific standards aim to align with the Financial Accounting Standards Board's ("FASB") standards.[4] In addition, the International Integrated Reporting Council ("IIRC") propagates an ambitious effort to codify corporate reporting across financial and non-financial factors (including but not limited to ESG data) (IIRC, 2011).[5]

Amel-Zadeh and Serafeim (2018) noted that a large proportion of investors view the lack of data standardisation and comparability as a hurdle for examining firms' ESG factors. Specifically, they show the adoption of a single standard would be a precondition to widespread and meaningful use by institutional investors. In part, this may require more data and analysis to determine which ESG criteria are most impactful to long-term firm performance and other non-financial considerations (*ie*, environmental and social sustainability).

Various ESG-focused rating agencies have risen to fill the need for objective and standardised evaluations of a firm's ESG, allowing investors to evaluate and compare firms along this metric. However, in some ways, this has made the problem even more difficult, as investors are now presented with competing ESG ratings by different data vendors.

[3] See GRI, Standards, http://www.globalreporting.org/standards.
[4] See SASB, Standards Overview, http://www.sasb.org/standards-overview.
[5] International Integrated Reporting Council ("IIRC"), "Towards Integrated Reporting: Communicating Value in the 21st Century" (2011), https://integratedreporting.org/wp-content/uploads/2011/09/IR-Discussion-Paper-2011_spreads.pdf.

Furthermore, the literature in this area illustrates some of the difficulties that investors face when considering ESG ratings.

How can we make sense of the different data providers in order to get a good handle on evaluating the different indices and disclosure standards? It is helpful to turn to Eccles and Stroehle (2018) who dichotomize ESG data providers as values-driven or values-oriented, with only little consolidation and convergence over time. Much of the early research sought to show that there is no correlation or agreement among CSR ratings (Chatterji and Toffel, 2010). For instance, competing environmental ratings are strongly correlated (Delmas et al., 2013). Another example along the same lines is Daines et al (2010), who find little predictive power of corporate governance ratings for performance, but slightly better for ratings based on financial disclosures rather than on qualitative information on corporate governance. Similarly, other scholars find that ESG ratings are often influenced by market intermediaries and that changes in firm performance often precede the publication of a ratings change, thus making the rating less useful for investors since it conveys only information already absorbed by market prices (Doh et al., 2009).

These results may be unsurprising. Indeed, a large part of the problem in comparing ESG ratings is the lack of a consensus as to what is good, as well as the highly subjective nature of the assessments made by ESG rating agencies. Furthermore, the lack of a consistent definition of positive sustainability makes it difficult to account for sustainability and empirically compare or test companies on these metrics (Gray, 2010). However, despite the difficulties and inherent subjectivity in constructing ESG ratings, previous empirical work has found high correlations among the major ESG rating providers despite differing emphases by the data providers.[6]

2.2.3 ESG and Investment Performance

In this section, we now consider a theoretical paradigm of firm investments in ESG quality and the reactions of hypothetical investors. We examine the relevant prior empirical literature on ESG criteria and financial performance.

[6] See chapter 3 of this thesis.

Theory tells us that if firms are investing in ESG with no financial return, this will reduce their profitability and consequently the returns available to investors. The theoretical literature on ESG postulates that ESG investments are driven by a subset of investors who have a non-financial component of utility, and these investors are willing to accept lower returns in exchange for investing in securities with strong ESG qualities (Riedl and Smeets, 2008).

As such, companies investing in ESG criteria will reduce their returns if these expenditures are not also correlated with positive financial returns. This may be the case, for example, if a firm invests in energy-saving technologies to reduce its carbon footprint, and this creates a positive externality of lowering the firm's energy costs. As is often the case, a firm may invest in green technologies with the purely financial motive of reducing costs, but the investment may coincidentally improve its environmental rating. Investors in these funds see positive environmental performance as a sign of a high-quality company (Dowell et al., 2000). Evidence also suggests that firms with better environmental performance have higher intangible-asset valuations, which may indicate positive technological spill over from green investments (Konar and Cohen, 2001). McWilliams and Siegel (2001) argue that firm returns from ESG investments follow a concave function, and, thus, there is an optimal point at which the benefits, in terms of the decreased cost of capital, from investments in ESG exceed the costs of such investments.

Another possible link between ESG and firms' financial performance may be due to the combined effects of a sufficiently large number of investors acting on a non-financial motive to slant their portfolios towards firms with strong ESG criteria and away from weaker-scoring ESG firms. While these investors are motivated, in part, by non-financial motives, if a sufficiently large number of investors act in a similar fashion, there will be fewer investors willing to hold poor-quality ESG firms. Therefore, it will be harder to diversify the risk of holding these firms, and the investors willing to hold these firms' securities will demand a higher risk premium because of the reduced diversification possibilities. The subset of investors acting this way needs to be just large enough to raise the cost of capital for firms that do not invest in ESG in order to provide such firms with a positive financial incentive to invest in ESG (Heinkel et al., 2001). In other words, investments in ESG increase firms' value by lowering the cost of capital.

Many empirical studies have examined the financial performance of such funds with ESG-related mandates, as well as the impact that screening on ESG factors has on the funds' financial performance; these studies provide a mixed picture. To begin, Hong and Kacperczyk (2009) show that funds that shun "sin stocks" suffer lower returns, while Trinks and Scholtens (2017) find that investments in "sin stocks" generate superior returns. In another strand of the literature, Martin and Moser (2016) argue that the financial benefits to firms investing in being "green" and environmentally sustainable do not exceed the monetary costs, and Baker et al (2018) and Karpf and Mandel (2017) find that "green bonds" have lower risk-adjusted returns. Similarly, investors in ESG-focused mutual funds earn lower risk-adjusted returns (Renneboog et al., 2008; Reidl and Smeets, 2017). Meanwhile, Borgers et al (2015) find that green bond funds have generated superior returns over certain periods, and Barko et al (2018) present convincing arguments that ESG-focused activist investors can enhance firms' value. Moreover, several studies claim that firms' superior financial performance is correlated with positive ESG factors (Hamilton, 1995; Klassen and McLaughlin, 1996; Dasgupta et al., 2001; Derwall et al., 2004; Krüger, 2015). Finally, Friede et al (2015) suggest that more studies in the existing literature find a positive link between ESG and financial performance.

Despite the mixed empirical evidence, Amel-Zadeh and Serafeim (2018) find that many institutional investors, when considering ESG factors in their investment decisions, are motivated by financial performance. Some strands of the literature recognize the need to consider more closely the financial performance impacts of ESG factors at the portfolio level—ie, portfolio performance depends on how ESG is used in constructing an investment portfolio (Statman and Glushkov, 2008; Geczy et al., 2005; Verheyden et al., 2016). These studies find that positive returns from investment depend on how willing a fund manager is to deviate from strict ESG screening criteria. For example, Barnett and Salomon (2006) find that the link between performance and ESG depends on how the fund manager uses ESG and that positive returns depend on the usage of ESG criteria to weigh portfolios away from poor ESG companies rather than completely excluding them. The resulting connection between ESG and financial performance is also sensitive to the time period and the modelling method used for returns. A common finding among all of these studies is that a positive relationship with financial performance exists only when fund managers are able and willing to deviate from strict ESG screening criteria. For example, Sherwood and Pollard (2017) and Hanson et al (2017) argue that ESG can be used to diversify risks in portfolio construction. Consistent

with that view, Barnett and Salomon (2006), Hoepner et al (2018) and Hanson et al (2017) find that investors generally view ESG as important in managing tail risks. Supporting this view, Shafer and Szado (2019) and Bialkowski and Starks (2016), by examining volatility surfaces and measures such as lower partial standard deviations of returns, find some evidence that ESG factors are negatively related to extreme downside risks.

This supports our hypothesis that ESG criteria convey some information that relates to financial performance, but not enough to be able to rely on this information as a sole criterion. This is why strict ESG-themed mutual funds tend to underperform the market (Renneboog et al., 2008), despite empirical evidence of positive relationships between ESG factors and financial performance at the level of individual companies.

We also note that the focus of enforcement may differ by jurisdiction and may lead to a de facto standard that diverges from the reading of the regulations. This would lead to variances in investor and company behaviour among jurisdictions. Eccles et al (2011) find some evidence that the demand for specific ESG data differs by country, and while this may be due to cultural differences reflecting investor preferences for companies with different ESG characteristics, it can also be explained by potential differences in the relevance of E, S, or G characteristics to companies' financial performance.[7] For instance, if different jurisdictions tend to focus more on regulating companies on environmental criteria, then this would affect financial performance more than the other criteria, and investors would correspondingly be more interested in that dimension of ESG data.

2.3 Data and Methodology

This section describes our data collection methodology and provides a general description and summary statistics of the data.

[7] Ibid.

2.3.1 ESG Measurements

We use two different variables to measure firm-level ESG criteria: Bloomberg ESG disclosure scores and Sustainalytics ESG rankings.

The Bloomberg ESG disclosure score is not a quality measure; it measures only the extent of disclosure of ESG-related data by a company. It is a Bloomberg proprietary that ranges from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every ESG-related data point collected by Bloomberg.

Bloomberg states that “each data point is weighted in terms of importance” and “the score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector” (Bloomberg Financial Terminal).

The Sustainalytics ESG quality ranking is “assigned to the company based on its environmental, social and governance (ESG) total score relative to its industry peers” (Bloomberg Financial Terminal). The ranking ranges from 0 for the poorest ESG-quality companies to 100 for the best. Sustainalytics ESG ranking is meant to encompass a company's level of preparedness, disclosure and controversy involvement across all three ESG themes.

The Bloomberg ESG disclosure score measures the amount of ESG data a company reports publicly and does not measure the quality of a company's performance on any data point. However, we believe that part of being a high-quality ESG company is the transparency and disclosure of ESG quality. Furthermore, given the largely voluntary nature of ESG disclosure requirements, as well as the lack of standardisation, one of our hypotheses is that there will be a strong correlation between ESG disclosure and ESG quality. Additionally, the nature of the Bloomberg ESG disclosure score is somewhat more objective, as it does not assign subjective quality judgements to the individual ESG criteria aside from the relative importance of the data point itself and not what constitutes a “good” or “bad” quality.

While the Sustainalytics ESG quality score is widely published and used by industry (as evidenced by its prominence on the Bloomberg Financial Terminal), the ratings contain

significant value judgements as to what constitutes a company's "good" or "poor" performance with regard to ESG.[8]

We acknowledge the difficulty in applying rankings to measure ESG criteria; however, we believe that using each of these widely available rankings will provide a good proxy for the overall ESG quality of firms. While there is some difference of thematic emphasis (E vs S vs G) between the ESG rankings from various providers, there is a high degree of correlation among them.[9]

2.3.2 Dataset Construction

We choose six countries from which to construct a sample set of firms: the US as the world's largest financial market with a lack of a strong stewardship code or ESG disclosure requirements; the UK with its iterative, flexible stewardship code with a voluntary comply-or-explain approach; France with a legislative requirement for institutional investors to consider and explain ESG factors related to their investments; Switzerland as a large European financial market outside of the scope of EU regulations and a global leader in providing ESG products despite low ESG attention from domestic institutional investors (Röhrbein, 2012); and Japan and Australia for a comparison with two highly-developed Asian-Pacific financial markets. Australia is interesting as a large developed market with a strong Anglo-Saxon tradition related to financial markets and a "transplant" of the UK stewardship code. While Japan is also a highly developed financial market with strong American and Anglo-Saxon influences, its culture of corporate governance is very different with a high degree of cross-shareholdings and bank ownership. This means that Japan's use of a UK-style stewardship code regime may not be as appropriate as in the UK and Australia.

For each of these countries, we screen the 2015-2018 time period. We choose this relatively narrow time period for three reasons: (1) to be able to ensure the widest coverage of companies with respect to ESG data points; (2) to control for relatively recent changes with regards to the requirements related to ESG disclosure and stewardship codes; and (3) to minimize the effects of changing ESG ranking metrics across time.

[8] For a discussion of the various conceptual approaches to constructing ESG rankings and understanding divergences among the rankings, see Eccles and Stroehle (2018).
[9] See chapter 3 of this thesis.

We then screen for companies with market capitalisations over 700 million USD—or the local currency equivalent—that have both Bloomberg ESG disclosure scores and Sustainalytics ESG quality rankings available for at least one year during the 2015-2018 period. Furthermore, we eliminate observations where there is insufficient financial or equity price data to calculate our control variables.

Table 1 shows the variables that we use in our regression analyses, as well as the definitions and calculation methodologies. Table 2 shows the number of companies that survived our screening criteria by country. Table 3 provides univariate summary statistics for the companies in our dataset broken down by country.

2.4 Results

In this section, we describe the results of our analysis.

2.4.1 ESG Disclosure and Quality

We begin by considering the relationship between the extent to which a company discloses ESG data and the actual quality of the company's ESG metrics. In the absence of stringent and standardised disclosure requirements regarding ESG-related data, we expect companies to be more likely to disclose good-quality ESG data. If a company incidentally has good ESG data as a natural result of its operations, then there is a minimal marginal cost to disclose those data, which can make the company more attractive to the subset of investors driven by non-financial motivations to invest in companies with high-quality ESG data (Martin and Moser, 2016; Fama and French, 2007). It is also hypothesised in the literature that, given a sufficient number of ESG-driven investors, firms with high-quality ESG characteristics will enjoy lower costs of capital due to a greater number of investors willing to hold securities in such firms and the resulting ease of diversification (Heinkel et al., 2001). In this context, firms with high-quality ESG data have a clear financial incentive to disclose these data in order to reap the benefits of lower costs of capital.

In order to investigate the relationship between ESG disclosure and the quality of a firm's ESG criteria, we regress Bloomberg firms' ESG disclosure scores onto Sustainalytics ESG rankings. Since both data providers, Bloomberg and Sustainalytics, adjust their scoring by industry and over time, we control for these effects in our regressions. We perform this regression for the entire dataset controlling for country effects, and then separately for each of the six countries in our dataset. Table 4 shows the results of these regressions.

Across all regressions, we see a strong positive correlation between the quantity of ESG data disclosed by companies—as measured by the Bloomberg ESG disclosure scores—and the quality of a firm's ESG criteria—as measured Sustainalytics ESG rankings. The magnitude of this correlation tends to be lower in countries with more stringent ESG disclosure requirements and strong stewardship codes imposing ESG considerations on institutional investors. Hence, for example, we see that in the US the correlation is greater than one.

One possible explanation is that, in the US, for example, which has minimal ESG disclosure requirements, companies will be more likely to disclose ESG data when it is of high quality. Alternatively, or additionally, it may be that there is little demand among institutional investors in the US for ESG data. Again, this results in the situation in which companies with good ESG data are more likely to disclose data in order to appeal to the small subset of investors who demand ESG data; at the same time, however, firms with poor or no ESG data are likely to be shunned by investors who are motivated by ESG considerations.

If strong stewardship codes require most, if not all, institutional investors to consider ESG criteria, this creates widespread demand for ESG data from institutional investors, and we are likely to see smaller correlation coefficients between disclosure and the quality of ESG. Therefore, we contrast countries such as the US—with the coefficient of 1.3 due to a lack of a strong stewardship code requiring institutional investors to consider ESG information—with countries in which stewardship codes are much stronger, such as the UK and France, where the correlation coefficients are 1.1 and 0.8, respectively. (This effect is likely to become even stronger in the UK once the new stewardship code which explicitly references ESG comes into effect.) Sufficient demand for the securities of high-quality ESG companies by a large number of institutional investors could create a situation in which companies are forced to disclose ESG information regardless of its quality, and, consequently, average ESG quality

would improve over time as companies vie to attract widespread investor interest in their securities.[10]

2.4.2 ESG and Investment Performance

We now consider the relationship between ESG factors and investment performance. Basic finance theory tells us that a firm's expenditures on activities that do not yield positive financial returns will necessarily decrease the firm's value. Thus, we distinguish between two possibilities: companies invest solely to improve ESG criteria; or ESG quality is simply correlated with other company investments and industry characteristics that yield positive returns. If investments in ESG do not produce positive financial returns, then we would expect firms' financial performance to be negatively affected by their investments in loss-generating, ESG-enhancing activities.

Certain firm characteristics may be inadvertently correlated with ESG quality, or it may be the case that unrelated firm investments generate positive ESG-enhancing externalities. For example, empirical evidence supports the supposition of a positive relationship between a firm's environmental quality and its level of intangible assets (Dowell et al., 2000; Konar and Cohen, 2001). This relationship between intangible assets and environmental quality is due, in part, to firms in certain industries (*eg*, internet companies) incidentally having a lower carbon footprint because of the nature of their operations. Furthermore, firms that invest in more efficient technologies often develop technologies that are not only more cost-effective, but that also have smaller carbon footprints. Thus, ESG enhancement is a positive externality of otherwise non-ESG-motivated firm investments.

Government regulations that impose financial penalties on firms can create financial incentives for firms to invest in ESG criteria. Investors would consider current and expected future environmental regulations and resulting fines for firms with poor environmental criteria when valuing a firm's securities, and, therefore, poor environmental quality would be correlated with negative financial returns (see for example Hamilton, 1995; Klassen and McLaughlin, 1996; Derwall et al., 2004). Therefore, even when firms invest in improving

[10] See the cost of capital argument advanced by Heinkel et al (2001) and the empirical evidence on ESG and institutional holdings from Dyck et al (2019).

their environmental quality aside from positive profit-generating externalities, investors may consider such investments as a hedge by the company against more stringent environmental regulations being imposed in the future.

In the same vein as the relationship between a firm's environmental quality and performance, a firm may be able to generate positive financial returns, or at least hedge against potential risks, by investing in improving "social" criteria. Doing so would help the firm avoid or limit the risk of controversy and poor publicity (*ie*, reputational risk), as well as litigation related to negative "social" behaviour, such as discriminatory employment practices, health and safety violations, and labour law violations. Similarly, a firm's investments in better corporate governance structures and mechanisms may enhance its financial performance by reducing the risks of agency problems and rent-seeking behaviour by management, as well as the possibility of corporate fraud and other scandals, through improved firm governance and oversight. Given the risk-management characteristics of ESG investments, we expect to see a negative relationship between the quality of a firm's ESG characteristics and the riskiness of the firm's value.

2.4.2.1 ESG and Volatility

We now examine the effect of ESG criteria on the riskiness associated with investments in the firm, as measured by the volatility of equity prices. If ESG is, indeed, related to risk, as hypothesised, we would expect to find a statistically significant relationship with volatility.

Table 5a shows the results of regressions of Bloomberg's ESG disclosure score on annual volatility. We control for firm size using the log of assets, the level of intangible assets using Tobin's Q, and the degree of leverage using debt-to-asset ratios. We additionally control for industry, year, and firm-level effects for the regressions on all datasets. The regression on the combined dataset also controls for country-level effects. We then repeat these regressions using Sustainalytics ESG rankings in place of Bloomberg's ESG disclosure scores; the results of these regressions appear in Table 5b.

As Table 5a shows, we find statistically significant negative relationships between volatility and Bloomberg ESG disclosure scores for the full dataset and for the US dataset (coefficients

of -0.0461 with a standard error of 0.0179 for the full set and -0.0581 with a standard error of 0.0246 for the US set, both statistically significant at the five per cent level). Coefficients for the datasets of the UK, Switzerland, Australia, and France are also negative but lack statistical significance.

The coefficient for the regression on the Japanese dataset shows a statistically significant positive relationship between ESG disclosure scores and volatility (0.0749, with a standard error of 0.0276, with significance at the five per cent level). However, the exceptionally low volatility of the Japanese firms in our sample set (see univariate statistics in Table 3) may explain the opposite relationship between volatility and ESG in Japan.[11] Furthermore, we note that in the regressions, the relationship between Tobin's Q appears different for Japanese firms as for all other firms. While several studies support a link between environmental quality, firm performance, and Tobin's Q (Dowell et al., 2000; Konar and Cohen, 2001), ESG rankings in Japan may be dominated by governance criteria, resulting in a different relationship between overall ESG and Tobin's Q than prevails in most other countries. This would, in turn, explain the anomalous relationship between ESG and volatility in our dataset for Japan.

In Table 5b, we see similar results when we use the Sustainalytics ESG quality rankings in place of the Bloomberg ESG disclosure scores. While the negative relationship and statistical significance persists, we find that the magnitude (*ie*, absolute value) of the correlation coefficient is lower (-0.0167 for the full dataset with a standard error of 0.0078, and -0.0321 for the US data with a standard error of 0.0111, with statistical significance at the five per cent level). Coefficients for the UK's, Switzerland's, and France's datasets are also negative but they lack statistical significance. The coefficient for Australia is positive but has a high standard error and lacks statistical significance. While the coefficient for Japan is slightly positive (0.0196) and statistically significant at the ten per cent level, the coefficient is close to zero with a high standard error (0.0104). Additionally, with regard to Japan, we again note (as discussed above) the low range of volatility for the firms in the Japanese dataset, as well as the same inverted relationship between Tobin's Q and the Sustainalytics ESG ranking that we saw with the Bloomberg ESG disclosure score.

[11] Hanson et al. (2017), Hoepner et al. (2018), and Bialkowski and Starks (2016) have found evidence that ESG is related to extreme downside risk, and, therefore, higher levels of volatility would show a stronger relationship with ESG criteria.

We note that, while the direction and statistical significance is the same, there is a greater magnitude (*ie*, a higher absolute value of the coefficient) of the relationship between the Bloomberg ESG disclosure scores and volatility than there is between Sustainalytics ESG quality rankings and volatility. This is noteworthy because, even though the two scores are generally correlated, the Bloomberg ESG disclosure score simply measures the amount of ESG data that firms disclose, while the Sustainalytics score is a quality ranking of firms with regard to their ESG characteristics. It is possible that companies that disclose more ESG data experience lower volatilities and that this effect is largely independent of changes in actual ESG quality.

Disclosure itself, ESG or otherwise, may signal that firms are very open and transparent; thus, investors are more certain of these companies' fundamental value, and, thus, there is less volatility in these firms' equity prices. This would mean that the actual effect of ESG on volatility is lower than that measured by the Bloomberg ESG disclosure scores and more in line with what is seen with the Sustainalytics ESG rankings. Alternatively, it may be that there is a time lag between when a firm releases ESG data and when Sustainalytics updates its ESG rankings. The market would then react to changes in ESG quality conveyed by the raw ESG data that the firm discloses before the ESG rankings are updated.

Our results related to ESG and volatility are broadly consistent with other empirical studies that have found links between firm risk and ESG (Barko et al., 2018; Bialkowski and Starks, 2016; Shafer and Szado, 2019) and with the literature that has found that investors tend to view ESG criteria as important for managing portfolio risk (Amel-Zedeh and Serafeim, 2018; Hanson et al., 2017).

2.4.2.2 ESG and Risk-Adjusted Returns

The results of our analyses of ESG and firm volatility suggest that ESG may have a small but statistically significant impact on reducing volatility. However, the question remains: does this effect translate into improved financial performance in terms of overall risk-adjusted returns?

As noted, the theoretical literature argues that if we allow for a subset of investors who are motivated, at least in part, by a non-financial component to their utility functions (Fama and French, 2007), then we will see that such investors are willing to pay a premium for securities in firms with high ESG quality. This bidding-up of these securities' prices will result in poorer performance of such securities, while arbitrageurs can capitalize on the relative under-pricing of securities in firms with poor ESG quality (Hong and Kacperczyk, 2009). However, sufficient widespread shunning of poor ESG-quality investments may result in an increased cost of capital for such firms, as investors willing to hold such securities find it more costly to diversify away the firm-specific risks in their portfolios, resulting in those investors demanding a premium for holding such securities (Heinkel et al., 2001). On the other hand, empirical studies focused on ESG-related mutual funds have supported the underperformance hypothesis whereby ESG-focused investors are willing to accept poorer risk-adjusted returns in exchange for the non-financial utility of holding high-quality ESG investments (Riedl and Smeets, 2017; Renneboog et al., 2008).

Given the conflicting theoretical predictions and the mixed results of the previous empirical literature, we expect ESG quality to have no substantial effect on security performance.

In order to investigate the potential relationship between ESG and risk-adjusted returns, we regress ESG rankings on annual security returns (assuming reinvested dividends) while controlling for risk by using annual volatility as a control variable. By using industry dummies, we control for the fact that certain industries have, by their very nature, activities that generate positive ESG externalities. In order to control for leverage, we use a firm's debt-to-assets ratio. We also control for a firm's level of intangible assets by using firms' Tobin's Q ratios.

Table 6a shows regressions using Bloomberg's ESG disclosure scores on financial performance adjusted for risk, as measured by volatility. We perform the regression using our entire sample set controlling for country effects and then separately for each country. All regressions control for industry, year, and firm-level effects. Table 6b repeats these regressions using Sustainalytics ESG rankings instead of Bloomberg ESG disclosure scores.

Comparing the regressions in Tables 6a and 6b, we see that the only statistically significant relationship found between ESG and performance is for the regression with the US dataset in

Table 6a, where we find a coefficient on Bloomberg's ESG disclosure score of -0.0799 with a standard error of 0.0460 and statistical significance at the ten per cent level. Although the relationship is negative and, therefore, lends some support to the theoretical literature that predicts negative returns as ESG-focused investors pay a premium for companies with high-quality ESG, the effect is small, with such a standard error that the effect is often even closer to zero. Furthermore, we find no statistical significance with the regressions on any other dataset in Table 6a or for the regressions in Table 6b using the Sustainalytics ESG rankings.

As reported above, there is some evidence of a statistically significant relationship between Bloomberg's ESG disclosure scores and risk-adjusted returns, but none when the Sustainalytics ESG quality rankings are used in place of the Bloomberg scores. This may be due to the fact that ESG information takes some time to be absorbed by the market. Thus, by the time that Sustainalytics ESG rankings are updated, any new ESG data is already reflected in security prices. Since there is a strong positive correlation between ESG disclosure and quality, there is support for this hypothesis. However, the alternative hypothesis is that the effect may not be related to ESG, but simply to the fact that companies with higher ESG disclosure scores disclose more extensive data generally (both non-ESG and ESG-related data), and this serves to signal high-quality firms with superior financial performance. This alternative hypothesis is supported by the fact that we have found no statistically significant relationship between Sustainalytics ESG rankings and financial performance. This would also explain the lack of a statistically significant relationship in countries other than the US, where ESG disclosure is more widespread due to disclosure requirements and stewardship codes. The more "mandatory" nature of ESG disclosure means that it is not only high-quality firms that are disclosing ESG data. Therefore, the relationship between transparent, lower-risk firms and ESG disclosure scores in the US is lost in jurisdictions where every firm is required (explicitly or implicitly) to disclose ESG information.

Nonetheless, the absence of a strong relationship between ESG and risk-adjusted returns may be due to the fact that the effect becomes more pronounced only during times of high market stress. This conclusion is also supported by prior empirical literature evidencing that ESG is related to extreme downside risk (Hanson et al., 2017; Hoepner et al., 2018; Bialkowski and Starks, 2016; Shafer and Szado, 2019). Otherwise, the limited reduction in volatility is not consistently strong enough to affect risk-adjusted returns across our sample size and time period.

Even though our regressions show only some weak evidence of a connection between ESG and risk-adjusted returns, we do find some compelling evidence of a negative relationship between ESG and volatility, which may mean that there are portfolio diversification benefits from high-quality ESG investments in certain situations. This leaves open the possibility for the creation of portfolios that, over some time, may generate superior financial performance by incorporating specific ESG screening and weighting rules into portfolio construction (Verheyden et al., 2016; Barnett and Salomon, 2006; Sherwood and Pollard, 2017; Statman and Glushkov, 2008). Furthermore, this would not be inconsistent with the results of prior empirical studies which found a negative relationship between ESG and performance by examining ESG-focused mutual funds (Riedl and Smeets, 2017; Renneboog et al., 2008). This is because such funds may not be using optimal ESG screenings and, instead, simply appealing to investors who are willing to accept lower returns in exchange for high ESG quality.

2.5 Conclusion

This article contributes to the current debate about the desirability of introducing mandatory corporate reporting on ESG issues. Using a unique dataset constructed from two commercially available databases, we conduct three sets of tests to examine the link between the extent of the disclosure of ESG quality through a cross-country comparison of varying ESG disclosure requirements and stewardship codes. Our data yield a number of interesting findings. First, we find a strong relationship between the quantity of ESG data disclosed by companies and the quality of this data. Second, the differences across countries seem to be driven by more stringent ESG disclosure requirements and stewardship codes imposing ESG disclosure. Third, we find evidence that ESG is correlated with decreased risk, though this effect may be due to firms disclosing more information than just the quality of the firms' ESG factors. Finally, we find a negative relationship between ESG and performance in the US, which is consistent with the fact that ESG-oriented investors are willing to pay a premium for high-quality ESG investments.

2.6 Tables

Table 1

Summaries of the definitions of variables used in our data analysis.

Variable	Definition
Bloomberg ESG disclosure score	Proprietary Bloomberg score based on the extent of a company's publicly disclosed ESG data. Scores range from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Bloomberg tailors the scoring to different industries. Bloomberg field: "ESG_DISCLOSURE_SCORE".
Sustainalytics ESG ranking	Sustainalytics assigns a rank to the company based on its total ESG quality relative to its industry peers. Scores range from 0 to 100. Bloomberg field: "SUSTAINALYTICS_RANK".
log assets	We use the natural logarithm of a company's book asset value in order to control for relative size in our regression analyses. This corresponds to the natural logarithm of the Bloomberg field "BS_TOT_ASSET".
debt to assets	In order to control for leverage, we calculate the ratio of firm debt to the book value of assets. This corresponds to the quotient of the Bloomberg fields "SHORT_AND_LONG_TERM_DEBT" / "BS_TOT_ASSET".
volatility	To measure the risk of holding a company's security, we use historical volatility calculated by Bloomberg as the annualised standard deviation of the relative price changes for the daily closing prices over the previous calendar year. Bloomberg field: "VOLATILITY_360D".
annual total returns	Annual total return of the company's primary security over the previous calendar year assuming reinvested dividends. Bloomberg field: "CUST_TRR_RETURN_ANNUALIZED".
Tobin's Q	We use Tobin's Q to control for the level of a firm's intangible assets. It is the ratio of the market value of a firm to the replacement cost of the firm's assets. The ratio is computed by Bloomberg as: (Market Cap + Total Liabilities + Preferred Equity + Minority Interest) / Total Assets. Bloomberg field: "TOBIN_Q_RATIO".
industry	In our regressions, we use industry dummies based on the Global Industry Classification Standard (GICS) developed by MSCI in collaboration with Standard & Poors (S&P). The GICS classification assigns a sector name to each company according to its principal business activity. Bloomberg field: "GICS_SECTOR_NAME".
market capitalisation	We screen for companies using market capitalisation. Bloomberg field: "HISTORICAL_MARKET_CAP".

Table 2

Coverage of Bloomberg ESG disclosure scores and Sustainalytics ESG rankings data by country over the 2015-2018 time period among publicly traded companies with a market capitalisation of at least 700 million USD (or local currency equivalent).

	United States	United Kingdom	Japan	Switzerland	Australia	France
Individual firms with market capitalisation over USD 700 million (or local currency equivalent)	2700	397	816	150	221	192
...with Bloomberg ESG disclosure score	1600	227	653	58	162	110
...with Sustainalytics ESG ranking	653	111	345	36	75	76
...with both Bloomberg ESG disclosure score and Sustainalytics ESG ranking	597	105	300	35	71	76

Table 3

Univariate statistics for the variables broken down by each national dataset and the full combined set. The number of observed values in each dataset in parentheses. The values for market capitalisation in millions of units of local currency.

Full Set (n=4084)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
Volatility	27.57	10.85	166.94	10.44	16.16	45.49
annual total returns	6.43	-86.76	287.38	27.23	-34.85	49.27
Tobin's Q	1.94	0.51	20.92	1.51	0.94	4.66
log assets	10.83	5.87	19.50	2.36	7.93	15.35
debt to assets	0.28	0.00	3.89	0.21	0.00	0.60
Bloomberg ESG disclosure score	35.77	2.89	75.62	14.48	14.88	58.68
Sustainalytics ESG ranking	50.83	0.00	100.00	28.02	5.50	94.90

United States (n=2136)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
Volatility	27.32	10.85	148.42	11.32	15.72	48.23
annual total returns	5.29	-86.60	239.34	28.33	-39.16	48.08
market capitalisation	34385	790	737470	61774	4105	136280
Tobin's Q	2.18	0.51	20.92	1.58	0.98	5.19
log assets	9.84	6.35	14.78	1.33	7.89	12.30
debt to assets	0.33	0.00	3.89	0.24	0.02	0.67
Bloomberg ESG disclosure score	31.39	7.85	75.62	14.30	14.82	57.03
Sustainalytics ESG ranking	45.87	0.00	100.00	25.98	5.30	87.50

United Kingdom (n=390)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
Volatility	27.80	14.04	166.94	12.61	17.20	45.73
annual total returns	5.46	-73.61	287.38	33.45	-36.95	52.74
market capitalisation	22449	1050	279200	36803	2492	95411
Tobin's Q	1.81	0.67	12.30	1.31	0.92	3.64
log assets	9.61	5.99	14.76	1.72	7.63	13.43
debt to assets	0.24	0.00	1.00	0.15	0.00	0.51
Bloomberg ESG disclosure score	43.20	23.55	69.42	9.99	29.34	59.50
Sustainalytics ESG ranking	68.21	0.00	100.00	22.71	23.75	97.34

Japan (n=893)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
Volatility	30.18	13.60	70.18	7.72	19.23	43.84
annual total returns	8.58	-58.16	118.20	22.59	-19.66	52.96
market capitalisation	1437100	93676	26380000	1986600	259970	4700800
Tobin's Q	1.54	0.59	14.25	1.42	0.88	3.07
log assets	14.35	10.42	19.50	1.46	12.31	16.86
debt to assets	0.21	0.00	0.88	0.18	0.00	0.56
Bloomberg ESG disclosure score	36.96	2.89	62.81	13.28	12.81	54.98
Sustainalytics ESG ranking	41.30	0.00	100.00	26.62	1.56	87.19

Switzerland (n=119)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	22.06	11.22	63.41	7.33	13.60	34.49
annual total returns	3.89	-86.76	65.11	22.43	-32.14	37.26
market capitalisation	39292	1087	256230	61104	3579	210470
Tobin's Q	2.07	0.88	7.52	1.26	0.95	4.71
log assets	10.19	7.54	13.77	1.70	7.92	13.62
debt to assets	0.19	0.00	0.48	0.14	0.00	0.43
Bloomberg ESG disclosure score	43.36	8.68	65.70	16.14	12.81	64.05
Sustainalytics ESG ranking	66.37	0.00	100.00	29.80	7.32	99.11

Australia (n=271)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	25.99	13.10	65.30	8.74	16.34	42.26
annual total returns	10.22	-51.57	232.34	27.49	-29.19	52.17
market capitalisation	19313	1230	142930	27318	3403	89186
Tobin's Q	1.94	0.75	11.89	1.65	0.96	5.87
log assets	9.52	5.87	13.79	1.58	7.33	13.61
debt to assets	0.26	0.00	0.78	0.15	0.00	0.58
Bloomberg ESG disclosure score	37.80	14.88	63.07	12.60	17.77	58.12
Sustainalytics ESG ranking	59.57	3.17	100.00	25.59	15.40	96.22

France (n=275)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	24.70	14.10	85.93	7.82	15.87	38.37
annual total returns	6.96	-67.72	87.81	23.32	-34.03	45.35
market capitalisation	23739	744	129850	25457	3841	90283
Tobin's Q	1.53	0.79	7.22	0.90	0.95	2.98
log assets	10.31	7.73	14.55	1.48	8.53	13.71
debt to assets	0.26	0.00	0.66	0.14	0.02	0.52
Bloomberg ESG disclosure score	50.13	21.07	67.36	8.93	30.58	61.98
Sustainalytics ESG ranking	80.29	7.41	100.00	20.07	38.80	100.00

Table 4

Regressions of firms' Bloomberg ESG disclosure scores onto firm Sustainalytics ESG rankings. Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Sustainalytics ESG ranking						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
Bloomberg ESG disclosure score	1.3041**	1.3352**	1.1168**	1.4464**	1.4809**	1.1665**	0.8463**
	[0.0233]	[0.0300]	[0.1145]	[0.0548]	[0.0952]	[0.1018]	[0.1373]
year effects	yes	yes	yes	yes	yes	yes	yes
industry effects	yes	yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
n	4084	2136	390	893	119	271	275
r-squared	0.5444	0.4987	0.2987	0.4786	0.7766	0.5275	0.2036

* indicates significance at the 10 per cent level; ** 5 per cent level

Standard errors appear in brackets below coefficients

Table 5a

Regressions of firms' Bloomberg ESG disclosure scores onto annual volatility of security returns. Control variables control for size (log of assets), leverage (debt-to-asset ratio), and intangible asset level (Tobin's Q). Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Annual volatility						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
log_assets	-1.4058**	-1.5797**	-2.0907**	-1.4412**	-1.2717	-2.1159**	-0.7108
	[0.2177]	[0.3388]	[0.6917]	[0.3454]	[1.1557]	[0.8008]	[0.5087]
debt_to_assets	4.6772**	2.9709**	16.5959**	3.7340*	18.8112**	12.4518**	3.4373
	[1.0404]	[1.3105]	[5.6945]	[2.1765]	[6.3812]	[5.2059]	[3.9807]
TOBIN_Q	-0.8644**	-0.8781**	-2.9951**	0.4748**	-2.3929**	-1.2394**	-1.5593**
	[0.1438]	[0.1880]	[0.6820]	[0.2306]	[0.9704]	[0.4724]	[0.6291]
Bloomberg ESG disclosure score	-0.0461**	-0.0581**	-0.0719	0.0749**	-0.0581	-0.0224	-0.0415
	[0.0179]	[0.0246]	[0.0967]	[0.0276]	[0.0820]	[0.0754]	[0.0648]
year effects	yes	yes	yes	yes	yes	yes	yes
industry effects	yes	yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
firm-level effects	yes	yes	yes	yes	yes	yes	yes
n	4049	2136	390	893	119	271	275
r-squared	0.2841	0.3149	0.2609	0.2493	0.4438	0.3931	0.4252

* indicates significance at the 10 per cent level; ** 5 per cent level

Standard errors appear in brackets below coefficients

Table 5b

Regressions of firms' Sustainalytics ESG rankings onto annual volatility of security returns. Control variables control for size (log of assets), leverage (debt to asset ratio), and intangible asset level (Tobin's Q). Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: volatility						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
log_assets	-1.5124**	-1.6744**	-2.1594**	-1.2553**	-1.4704	-2.5439**	-0.9409
	[0.2063]	[0.3184]	[0.6506]	[0.3334]	[0.9883]	[0.7060]	[0.5989]
debt_to_assets	4.7002**	2.8466**	15.9711**	3.3739	18.8391**	12.9010**	2.5632
	[1.0381]	[1.3050]	[5.7007]	[2.1831]	[6.3537]	[5.2248]	[4.9186]
Tobin's Q	-0.8705**	-0.8972**	-2.9867**	0.4016*	-2.3462**	-1.2748**	-1.8456**
	[0.1436]	[0.1870]	[0.6829]	[0.2296]	[0.9645]	[0.4716]	[0.8400]
Sustainalytics ESG ranking	-0.0167**	-0.0321**	-0.0415	0.0196*	-0.0244	0.0302	-0.0012
	[0.0078]	[0.0111]	[0.0345]	[0.0104]	[0.0331]	[0.0241]	[0.0333]
year effects	yes	yes	yes	yes	yes	yes	yes
industry effects	yes	yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
firm-level effects	yes	yes	yes	yes	yes	yes	yes
n	4049	2136	390	893	119	271	275
r-squared	0.2857	0.3226	0.2669	0.2530	0.4615	0.3858	0.4113

* indicates significance at the 10 per cent level; ** 5 per cent level

Standard errors appear in brackets below coefficients

Table 6a

Regressions of firms' Bloomberg ESG disclosure scores onto annual security returns. Control variables control for size (log of assets), leverage (debt to asset ratio), intangible asset level (Tobin's Q), and riskiness (annual volatility). Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Annual total returns						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
Log assets	1.8710**	2.7636**	2.7371*	0.4342	-4.6718*	2.0427	1.0172
	[0.4026]	[0.6032]	[1.4134]	[0.8010]	[2.4105]	[2.1106]	[1.1571]
Debt to assets	-9.6445**	-8.7422**	-33.3377**	-3.8521	-0.8687	-8.8316	-16.7788*
	[2.0138]	[2.3931]	[12.2845]	[5.2155]	[17.4777]	[14.4565]	[9.4450]
Tobin's Q	4.1737**	5.3730**	6.5407**	1.9534**	-0.5327	2.2478	1.7519
	[0.3109]	[0.4133]	[1.4964]	[0.5987]	[2.3261]	[1.3751]	[1.6049]
Annual volatility	-0.0991**	-0.2324**	0.7624**	0.0198	-1.1006**	0.3073	-0.6816**
	[0.0439]	[0.0567]	[0.1399]	[0.1234]	[0.3101]	[0.2409]	[0.1451]
Bloomberg ESG disclosure score	-0.011	-0.0799*	0.0255	0.0344	0.2488	-0.1122	-0.0625
	[0.0348]	[0.0460]	[0.1990]	[0.0706]	[0.1838]	[0.2075]	[0.1587]
year effects	yes	yes	yes	yes	yes	yes	yes
industry effects	yes	yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
firm-level effects	yes	yes	yes	yes	yes	yes	yes
n	4049	2136	390	893	119	271	275
r-squared	0.1847	0.2644	0.2493	0.1594	0.5489	0.1753	0.3742

* indicates significance at the 10 per cent level; ** 5 per cent level

Standard errors appear in brackets below coefficients

Table 6b

Regressions of firms' Sustainalytics ESG disclosure scores onto annual security returns. Control variables control for size (log of assets), leverage (debt to asset ratio), intangible asset level (Tobin's Q), and riskiness (annual volatility). Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Annual total returns						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
Log assets	1.8322**	2.4445**	2.7556**	0.6835	-3.0811	1.712	0.8963
	[0.3798]	[0.5585]	[1.3161]	[0.7709]	[2.1045]	[1.9326]	[1.1193]
Debt to assets	-9.6202**	-8.7163**	-32.9778**	-4.0119	0.3428	-9.3359	-15.963*
	[2.0122]	[2.3982]	[12.3215]	[5.2042]	[17.7505]	[14.5132]	[9.2844]
Tobin's Q	4.1715**	5.3164**	6.5374**	1.8860**	-0.6496	2.1963	1.9093
	[0.3109]	[0.4116]	[1.4962]	[0.5891]	[2.3562]	[1.3705]	[1.6627]
Annual volatility	-0.0989**	-0.2362**	0.7654**	0.0322	-1.1445**	0.3233	-0.673**
	[0.0440]	[0.0570]	[0.1406]	[0.1231]	[0.3132]	[0.2391]	[0.1436]
Sustainalytics ESG ranking	-0.0025	-0.023	0.0183	-0.0084	0.0444	-0.0339	0.0043
	[0.0165]	[0.0223]	[0.0736]	[0.0302]	[0.0857]	[0.0901]	[0.0645]
year effects	yes	yes	yes	yes	yes	yes	yes
industry effects	yes	yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
firm-level effects	yes	yes	yes	yes	yes	yes	yes
n	4049	2136	390	893	119	271	275
r-squared	0.1940	0.2637	0.2631	0.1492	0.5564	0.1758	0.3738

* indicates significance at the 10 per cent level; ** 5 per cent level

Standard errors appear in brackets below coefficients

3 Institutional Investors and ESG Preferences

Abstract

We study the effect of environmental, social and governance (ESG) scores on the portfolio allocations of institutional investors. Using a unique dataset, we find that institutional investor holdings (as measured by 13F filings) are strongly driven by the ESG quality of companies. While investors are driven to add high-quality ESG companies to their portfolios, there is a negative relationship with ESG when it comes to taking large ownership stakes. Blockholders appear much less motivated by ESG scores. Evaluating individual components of ESG scores, we find that the Governance scores have the highest impact on institutional investor holdings, while the E scores have the most negative effect. This is partly explained by risk and return measures. Higher E scores are correlated with negative alpha indicating that such securities may be overbought. Meanwhile, G scores have a strong correlation with higher Sharpe ratios, indicating a more favorable risk-reward profile, and lower correlation with betas, pointing to less exposure to systemic risk. When comparing ESG scores across providers, the Bloomberg disclosure-based ESG scores are more significant determinants of investor holdings and risk-return measures than the subjective Sustainalytics ratings, suggesting that disclosure is a more important determinant for institutional investors.

3.1 Introduction

Environmental, social and governance (ESG) scores are important for the sustainability investment decisions of institutional investors. According to *Morningstar* (2020), the amount of net inflows into ESG open-end and exchange traded funds in the United States exceeded USD 20 billion in 2019. Data from the Global Sustainable Investment Alliance (2021) indicate that total sustainable investment assets in the US increased from USD 12 trillion at the start of 2018 to USD 17.1 trillion at the start of 2020, and the amount of global sustainable assets under management exceeded USD 35.3 trillion as of July 2021. In addition, sustainable equity and bond funds have recently proved less risky than their traditional peer funds. Along with the increasing cash flow into ESG strategies, this highlights the central importance of investigating how the ESG factors influence portfolio allocations of various types of investors. In this paper, we tackle this question analyzing ESG scores across providers and breaking up the scores into their environmental (E), social (S) and governance (G) components.

There is a large literature on the effect of ESG on financial performance (see Whelan et al., 2021, for a review). A common explanation for increased investor demand focuses on the non-pecuniary component of investor utility functions (see, for example, Fama and French, 2007; Riedl and Smeets, 2017; Renneboog et al., 2008a, 2008b). According to this literature, higher-rated sustainability funds are more successful than lower-rated funds at attracting a flow of funds, but the high-sustainability funds have underperformed compared to low-sustainability funds (Hartzmark and Sussman, 2019). While some studies have touched on the link between ESG scores and the portfolio constructions of institutional investors (see, for example, Gibson et al., 2021), little is known about how the individual E, S and G factors influence investors' portfolio decisions.

We hypothesize that institutional investors might consider ESG in their investment decision making processes for one of three main reasons. The first reason involves the existence of a subset of investors with a non-pecuniary component in their utility functions which makes them willing to accept investments with poorer financial performance as long as these investments have positive ESG characteristics (Fama and French, 2007; Riedl and Smeets, 2017; Renneboog et al., 2008a, 2008b). This reason may help understand the empirical results documenting the relative underperformance of ESG mutual funds, as well as the flow of funds in to and out of ESG funds as a function of ESG performance (Hartzmark and Sussman, 2019 and Renneboog et al., 2008a and 2008b). Given a clientele with such preferences, asset managers could be incentivized to adopt ESG strategies for some or all of their investments. Additional evidence along this line shows that large asset managers can increase their total fee revenues more by growing assets under management, which appeal to this clientele, rather than by increasing the value of existing investments (Lewellen and Lewellen, 2022).

The second motive for investors to incorporate ESG into their asset management strategies is a potential relationship between ESG and superior financial performance (Statman and Glushkov, 2008; Barnett and Salomon, 2006; Sherwood and Pollard, 2018; and Hanson et al., 2017). Superior financial performance due to ESG quality may be explained by higher costs of capital faced by firms with poor ESG characteristics, if the subset of investors with non-pecuniary utility functions is sufficiently large. If these investors shun poor performing ESG companies, the remaining set of investors will find it more difficult to diversify investments

in these companies and will demand a higher cost of capital for holding them (Heinkel, et al., 2001). The higher cost of capital for companies with poor ESG quality may appeal to activist investors who can earn superior returns by investing in poor ESG companies and pushing them to improve their ESG performance and consequently their financial valuations (see Gilson and Gordon, 2013; Christie, 2021; and Barko et al., 2018). Related empirical evidence also suggests that improvements in ESG metrics are associated with decreased risk, potentially due to decreased regulatory, litigation, and reputational risks faced by firms with high ESG quality (Shafer and Szado, 2019; Hanson et al., 2017; Hoepner et al., 2019; Bialkowski and Starks, 2016; and Albuquerque et al., 2020).

Finally, very large asset managers, such as the Big Three (i.e., State Street, Blackrock, and Vanguard), may prefer investments with high ESG quality as a way to reduce their exposure to systemic risks. Very large asset managers are so well-diversified across industries and the economy as a whole (see for example Fichtner et al., 2017), that they are much less exposed to firm-specific risks, and are therefore motivated to reduce the systemic risks in their portfolios which are associated with ESG factors (e.g., climate risk). This is the argument of systematic stewardship proposed in Gordon (2022).

Our paper uses a unique dataset to examine the revealed preferences of institutional investors for ESG investments looking at their holdings of US-listed equities. We also examine how ESG scores relate to various financial performance measures. Our set of tests also break up and analyze the impact of the E, S and G scores individually. In particular, we are interested in testing the relative impact of governance factors in strategic asset-allocation decisions of institutional investors even among US-listed firms. Beyond the impact of investor protection embedded in regulation (La Porta et al, 1997, 1998, 2006 and 2014), the literature has established a relationship between superior financial performance and good firm governance characteristics (Gompers et al., 2003; Bebchuck, Cohen, and Wang, 2013). Following previous empirical studies have established a link between firm-level differences in governance and financial performance even within the same countries (see Beltratti and Stulz, 2009; Doidge et al., 2006), one could expect firm-level differences in governance to still impact institutional investor holdings and financial performance despite the relatively high level of overall governance among US firms.

To the best of our knowledge, this is the first paper that investigates institutional holdings to shed light on the relative preferences of investors across the three ESG dimensions. In order to measure institutional investors' interest in companies between 2013 and 2018, we derive our holdings data from SEC 13F and 13D/G filings of institutional investors and blockholders of US equities. Using this sample of the number of investors, the portfolio allocation of investors, and the holdings of blockholder investors, as well as the Big Three asset managers (Blackrock, Vanguard, and State Street), we find that most investors have a significant preference for investing in firms with high governance quality. Meanwhile, investors tend to limit portfolio stakes in firms with high environmental scores. A notable exception is among the Big Three, which invest heavily in firms dependent on environmental criteria (see, for example, Azar et al., 2021).

This result is consistent with our findings regarding ESG scores and financial performance. We find strong evidence that governance ratings have the most significant impact on increasing the Sharpe ratio of a firm's equity, implying a more favorable risk-return tradeoff. Higher governance scores are also related to decreased exposure to systemic risk, as measured by a security's beta. This result is consistent with the theory of systematic stewardship whereby very large asset managers are so well-diversified against firm-specific risks that their efforts are devoted to reducing systemic risk in their portfolios (Gordon, 2022). Environmental scores, on the other hand, have limited impact on a security's Sharpe ratio or beta; however, we find a negative relationship between environmental scores and alpha. This is evidence that the securities of firms with high environmental scores are overbought and, therefore, overvalued by the market. This is likely due to the interest of the Big Three in these types of firms, driven by the demand of many mutual fund investors in prioritizing non-financial incentives (Riedl and Smeets, 2017; Renneboog et al., 2008a, 2008b) and, consequently, contributing to the underperformance of ESG mutual funds (Renneboog et al., 2008a, 2008b; Hartzmark and Sussman, 2019).

We can distinguish two opposing views with respect to the impact of a company's ESG ratings on corporate financial performance. The first view holds that the composite ESG score alone can show the relationship with financial performance. The second view goes further, holding that the composite ESG score and component E, S, and G ratings together can accurately reflect the impact of ESG on corporate financial performance. The second view leads us to expect that the analysis of the E, S and G subfactors can explain how each of

the three dimensions separately contribute to firm value (Duque-Grisales and Aguilera-Caracuel, 2019; Gibson et al. 2019), as well as to ownership patterns.

In our analysis, we employ ESG rankings from Bloomberg and Sustainalytics. The Bloomberg ESG ratings are disclosure-based, measuring simply the amount of ESG data that companies disclose (i.e., companies with higher Bloomberg scores merely disclose more ESG data, but Bloomberg does not assess the data for quality). Sustainalytics ranks the actual quality of companies based on their ESG data. Both rating agencies provide a composite ESG ranking, as well as component rankings of the three ESG subcategories (E, S, and G). The rationale of such a strategy is to consider general investor preferences for ESG, as well as the relative preferences for the three components of ESG. Our empirical work focuses on the extent to which institutional investor allocations are driven by ESG rather than by companies' financial characteristics that have generally been shown to relate to financial performance (Fama and French, 1996, 2015; Carhart, 1997). We also control for general financial characteristics and industry effects in order to mitigate the effect of large index and tracking funds and still find statistically significant results. We provide two main points of evidence that the governance dimension of ESG has the highest impact on investor holdings.

In the first part of our empirical analysis, we distinguish investor preferences across the three dimensions of ESG. We calculate the number of institutional investors and blockholders investing in a particular firm, as well as the proportion of their total portfolios allocated to that firm, in order to determine how their holdings are affected by ESG characteristics. We also calculate the total ownership stake in the firm by the Big Three asset managers and the proportion of their portfolios allocated to the firm. Our evidence shows that institutional investors overall (as measured by data based on 13F filings) are strongly driven by the ESG quality of companies—particularly the governance dimension—when deciding which companies to add to their portfolios.

We also study whether the holdings of blockholders are influenced by the component and composite ESG ratings. Using 13D/G data, we find that blockholders, in particular, seem much less motivated by ESG. Our findings generally support the theoretical argument that the vast majority of institutional investors' long-term passive investments are driven disproportionately by ESG over other financial data when selecting companies to add to a portfolio; we also find, however, that investors taking large ownership stakes and activist

investors are much less concerned with ESG. Conversely, we find that larger portfolio allocations are negatively correlated with composite and component ESG rankings, but significantly less so with the individual governance ratings. We also find that the Bloomberg disclosure scores have a more significant relationship than the Sustainalytics quality scores.

In the second part of our analysis, we study the relationship between the individual ESG components and financial performance to provide evidence on whether institutional investors are overweighting ESG data due to the potential relationship between these data and financial performance. We find evidence that ESG is related to decreased risk and a more favorable risk-return tradeoff. These results are most significant for the governance score. There is evidence that higher environmental scores are related to overpriced securities. While the evidence is consistent with the prior literature on the portfolio optimization benefits of ESG, our findings in this regard do not explain institutional investors' strong preference for companies with high ESG scores when controlling for other financial characteristics. Further, the data indicate that a large proportion of institutional investors are driven by ESG when deciding whether or not to invest in a company and how much of their portfolio to allocate to the company.

The evidence suggests that the Bloomberg disclosure ratings are more strongly correlated with increased financial performance than are the subjective Sustainalytics quality ratings, and that better governance scores have the highest correlation with better Sharpe ratios and lower betas. Our findings highlight, among other things, that disclosure ratings tend to be more significant than subjective quality ratings due to the importance of the amount of the information disclosed along each ESG dimension. Furthermore, we find evidence of a negative relationship between the size of the ownership stake and ESG—companies that underperform with respect to ESG also underperform financially. Thus, it appears that these companies are potentially attractive to activist investors, who are willing to take larger stakes in underperforming companies.

We also find a negative relationship between ESG ratings and systemic risk, as measured by beta. In this analysis, we find the strongest relationship with the governance criteria, as measured by the disclosure scores. Our findings generally support the theoretical argument that the companies that disclose more ESG data tend to disclose more information generally,

thus providing investors with more information and helping to explain portfolio allocation trends of institutional investors.

We also explore the association between ownership stakes of large investors and corporate carbon emissions. In this analysis, we study how institutional investors' concerns about the greenhouse gas emissions of listed firms affect their holdings of high-emissions stocks (Choi et al, 2020). We find that the Big Three asset managers own larger ownership stakes in companies with higher greenhouse gas emissions (in line with the findings of Azar et al., 2021), and we show that this relationship extends to the proportion of their total portfolios allocated to such firms.

Our paper has several implications for the integration of the individual ESG components into the portfolio allocation process. First, we contribute to the literature that focuses on the role of ESG issues in the investment decisions of institutional investors (Barko et al., 2018; Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011; Hanson et al., 2017; Gibson et al., 2021). Relatively few studies have addressed the influence of institutional investors' ownership on companies' ESG performance. Closer to our study is work by Dyck et al. (2019), who examine the influence of institutional investor ownership on non-US companies' composite environmental and social (E&S) performance over time. However, our paper is the first to account for institutional investors' US equities holdings and, specifically, how they are influenced by both aggregate ESG scores and the individual ESG component scores. Our findings provide further evidence on the influence of ESG issues on blockholders and the size of the ownership stakes of institutional investors in relation to ESG.

Second, this study contributes to the body of literature examining the effects of ESG disclosure. Prior evidence on the value-added role of ESG disclosure has been related mainly to its positive effects on financial performance. Consequently, the prior literature has relied on examining the extent of the different types of ESG disclosure as opposed to the actual ESG quality of the investment. Our results are consistent with the findings that the largest institutional investors are seldom supportive of shareholder proposals related to E and S—as suggested by Griffin (2020)—and shed light by showing that, as the size of the ownership stake increases, investors care much less about ESG quality.

Third, our results are related to the literature that examines the role of composite ESG scores and the individual E, S, and G subdimensions in the financial performance of companies around the world. For example, prior evidence on the influence of ESG scores and the individual effects of the E, S, and G subfactors on the financial performance of multinational firms in Latin America can be found in Duque-Grisales and Aguilera-Caracuel (2019). We expand on these studies by using secondary data, rather than a global index, to study the effects of the individual E, S, and G dimensions on US companies. Additionally, Kotsantonis and Serafeim (2019) illustrate the difficulty in constructing consistent ESG ratings. Gibson et al. (2019) attribute differences in ESG ratings subfactors to the legal origins of the countries in which ratings providers are based, and Eccles and Stroehle (2018) argue that differences are inherent in the mission and goals of the ratings provider. Our paper extends these findings by analyzing ownership and financial performance.

The paper proceeds as follows. Section 2 reviews the ESG investment selection and performance literature. Section 3 introduces the data. Section 4 presents and analyzes the results of institutional investors' relative preferences for the three dimensions of ESG. Section 5 concludes.

3.2 Motivation and Literature Review

This section provides an overview of the existing theoretical and empirical literature, as well as the motivation for this research and the hypothesis development.

The prevailing theory behind investors' consideration of ESG factors involves incorporating ESG as a nonpecuniary component of the utility functions for a subset of market participants (Fama and French, 2007). Goldstein et al. (2021) extend this model to specifically consider ESG and the information quality related to security ESG criteria. Departing from the conventional risk-return tradeoff, these investors are willing to simply accept lower risk-adjusted returns in exchange for knowing that their investments have positive ESG qualities (Riedl and Smeets, 2017). This is analogous to how some consumers will pay more for fair-trade coffee that, in all other respects, is identical to non-fair-trade coffee (see, for example, Hainmueller et al., 2015). Part of the utility that these consumers receive is the knowledge that the coffee they are consuming is fair-trade. This suggests that ESG-motivated investors

are willing to sacrifice a degree of financial performance in exchange for knowing that their portfolio companies are green, environmentally "sustainable," and "socially responsible." In this new environment, they can signal that they engage in good corporate governance, environmental sustainability, and responsible investing—or some combination of these attributes.

The prior literature on ESG mutual funds and green bonds generally suggests that investors in these instruments have a preference or taste tor a nonpecuniary component of utility. Renneboog et al. (2008b), for instance, show that ESG mutual funds generate subpar financial performance. Hartzmark and Sussman (2019) find that investment funds tend to flow out of mutual funds with poor ESG credentials and into funds with higher ESG quality. And Baker et al. (2018) show that investors in green bonds are willing to pay a premium to invest in those bonds simply because they are certified as "green."

More broadly, there is evidence that institutional asset managers are widely incorporating ESG considerations into their portfolio management activities (Barko et al., 2018; Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011; Hanson et al., 2017). Dyck et al. (2019) also link institutional investor ownership in companies to ESG. However, their study considers only the companies' composite E and S scores. Furthermore, by combining the Bloomberg and Sustainalytics scores, they do not differentiate between companies' ESG quality and ESG disclosure characteristics. Other studies focus on the relationship between firm performance and both ESG scores and individual E, S, and G subfactors in equal proportion (Humphrey et al. 2012; Velte, 2017). Duque-Grisales and Aguilera-Caracuel (2019) document the influence of composite ESG scores and individual E, S, and G components on the financial performance of multinationals in Latin America.

Despite the evidence that a subset of ESG investors are willing to accept lower returns, another strand of the literature argues that ESG factors can be utilized to construct portfolios that generate superior risk-adjusted returns (see, for example, Sherwood and Pollard, 2018; Bannier et al., 2019 Hanson et al., 2017; Boze et al., 2019; Gibson et al., 2019). The effect on financial performance is stronger with regard to decreasing risk than to increasing returns (Gibson et al., 2019). In this respect, there is evidence that ESG firms are less exposed to extreme downside risk (Shafer and Szado, 2019; Hoepner et al., 2019). Moreover, the market might expect that firms with higher ESG scores would have lower implied volatility under

extreme circumstances, thus impacting the volatility smirks in the options markets for these securities and demonstrating lowered perceived tail risk (Shafer and Szado, 2019). There is also evidence that, based on ESG criteria, activist funds may be able to identify underperforming companies (Barko et al., 2018). It is reasonable to expect that firms with lower ESG scores are more likely to be targets of activist campaigns by institutional investors. Hence, boards must realize this and align themselves with investors by adopting effective ESG strategies.

While firms' investments in ESG factors may erode profitability, there appear to be two ways in which such investments can benefit individual firms. One such mechanism involves the cost of capital. If a significant subset of investors is motivated by ESG factors, this can affect the cost of capital of good- and bad-ESG companies (Heinkel et al., 2001). As investors who care about ESG shun companies with poor ESG quality, fewer investors will be willing to hold stocks in these companies; therefore, those who are willing will have to hold more of the outstanding stock, making it more difficult for these investors to diversify away firm-specific risks. Consequently, these investors demand higher risk premia to hold a higher proportion of the outstanding shares, which increases the cost of capital for such firms. Conversely, companies with good ESG metrics see their shares as more popular with investors, regardless of the risk-return characteristics. Thus, this inflates the prices of these securities and lowers the cost of capital for ESG firms that perform well.

On the other hand, it is also possible that firms' investments in ESG may generate positive NPV and contribute to firm profitability. Some investments in ESG may create positive externalities for the firm. For example, firms investing in technological innovations can lower their costs thanks to improved technology that may also be more environmentally friendly. This explains the positive relationship sometimes seen between environmental factors and Tobin's Q (see, for example, Dowell et al., 2000; Konar and Cohen, 2001). Hence, a firm's investments in ESG factors may also generate positive NPV if such investments protect the firm from other risks. For example, investments in environmental sustainability can protect firms from regulatory risk by reducing or eliminating fines for polluting and helping firms to anticipate tougher future environmental regulations (Dasgupta et al., 2001; Dowell et al., 2000; Konar and Cohen, 2001). Firms' investments in social responsibility may similarly help them mitigate litigation risks and corporate scandals.

We now explain the tradeoff between investors accepting subpar returns in exchange for positive ESG ratings, as well as the potential for ESG to have positive impacts on firm value and to serve as screening criteria to create superior-performing portfolios. To do so, we conjecture that a large number of long-term, primarily passive institutional investors encapsulate ESG as a nonpecuniary function of utility. This, in part, bids up the securities prices of some companies based solely on ESG considerations. At the same time, ESG can be related to the risks to which firms are exposed. This relationship opens up the possibility for ESG factors to be used to construct superior-performing portfolios for some investors whose utility functions do not consider (or at least underweight) ESG considerations. Alternatively, or additionally, some activist investors may use poor ESG performance as a way to identify companies that are facing a higher cost of capital and, therefore, underperforming financially (Barko et al., 2018). This is consistent with the theory that some investors can essentially arbitrage governance, as proposed by Gilson and Gordon (2013) and extended to ESG factors generally by Christie (2021).

Based on the subpar performance of ESG mutual funds, we conjecture that investors prefer strong ESG data to other financial data (i.e., ESG factors are their primary concern, followed by risk-return characteristics). Further, the collective actions of large numbers of institutional investors prioritizing ESG data should result in overvaluing securities relative to financial fundamentals. This leaves open the opportunity for activist investors to take larger stakes in companies that underperform with respect to ESG.

3.3 Data and Measurement

This section describes our dataset construction and provides an overview of the summary statistics of our dataset.

3.3.1 Measuring ESG

In contrast to the previous empirical works discussed above, we base our dataset on both composite ESG and the three ESG dimensions, to analyze institutional holdings along with financial performance metrics. Much of the previous empirical literature related to ESG and corporate financial performance focuses on a granular analysis of specific ESG data within

one dimension of ESG (E, S, or G). The previous literature on the investment performance of ESG as a whole tends to use data related to ESG mutual funds. Dyck et al. (2019) consider the relationship of the E and S dimensions with institutional investor holdings.

In this classification, we follow Duque-Grisales and Aguilera-Caracuel (2019) and Gibson et al. (2019), who analyze ESG along with each of its three dimensions and compare these with financial performance data. Additionally, we consider the relationship with investor holdings.

We obtain data on ESG composite ratings and the component ratings for each dimension—environmental, social, and governance—from two well-known data providers: Bloomberg and Sustainalytics.

The Bloomberg ESG disclosure score and the component scores are not quality measures; these ratings measure only the extent of a company's ESG-related data disclosure. It is a Bloomberg proprietary score that ranges from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every ESG-related data point collected by Bloomberg. Bloomberg states that "each data point is weighted in terms of importance" and that "the score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector" (Bloomberg Financial Terminal, 2019).

The Sustainalytics ESG quality ranking is "assigned to the company based on its environmental, social and governance (ESG) total score relative to its industry peers" (Bloomberg Financial Terminal, 2019). The ranking ranges from 0 for the poorest-ESG-quality companies to 100 for the best. The Sustainalytics ESG ranking is meant to encompass a company's level of preparedness, disclosure and involvement in controversy across all three ESG themes. The Sustainalytics component rankings similarly rank companies along each of the three ESG dimensions.

While the Bloomberg ESG disclosure scores measure the amount of ESG data a company reports publicly and not the quality of a company's performance on any data point, previous

research has shown that part of being a high-quality ESG company is the transparency and disclosure of ESG quality.[12]

In the context of our research question, the Bloomberg ESG disclosure score is a more objective and transparent measure than that of Sustainalytics: it does not assign subjective quality judgements to the individual ESG criteria, aside from the relative importance of the data point itself, and does not suggest what constitutes a "good" or "bad" quality. While widely published and used by industry, Sustainalytics scores, unlike Blommberg's, contain significant value judgements as to what constitutes a company's "good" or "poor" performance with regard to ESG.

Much of the early research sought to examine correlation or divergence among CSR ratings (Chatterji and Toffel, 2010). For instance, competing environmental ratings are strongly correlated (Delmas et al., 2013). Along the same lines, Daines et al. (2010), for example, find that corporate governance ratings have little predictive power for performance, but slightly more for ratings based on financial disclosures rather than on qualitative information on corporate governance. Similarly, numerous researchers find that market intermediaries often influence ESG ratings and that changes in firm performance often precede the publication of a ratings change, thus making the rating less useful for investors since it conveys only information already absorbed by market prices (Doh et al., 2010).

In a more recent study, Kotsantonis and Serafeim (2019) illustrate the difficulty in creating a standard and objective framework for reporting and evaluating ESG data metrics. While Eccles and Stroehle (2018) argue that the differences in ratings can be attributed to the "mission" and origins of the rating provider (i.e. "values-oriented" versus "value-driven"), Gibson et al. (2019) argue that discrepancies among ESG ratings may be due to differences in the legal systems of the countries where ratings providers are based. The latter view, however, overlooks the globalized nature of the ESG ratings market and the cross-country nature of some ratings due to partnerships between rating providers located in different countries (e.g., the Robeco index is jointly managed by S&P and Robeco). Regardless of the origins of the differences, it is clear that divergence is a significant issue when comparing ESG ratings data. Furthermore, any subsequent analysis may be highly sensitive to the ESG

[12] Chapter 2 of this thesis established that, given the largely voluntary nature of ESG disclosure requirements and the lack of standardization, there exists a strong correlation between ESG disclosure and ESG quality.

ratings provider being used. This is our motivation for using different ratings providers and demonstrating the sensitivity of our results to the particular rating.

3.3.2 Dataset Construction

This section describes our data collection methodology and provides a general description and summary of the data.

In constructing our dataset, we screened for US publicly listed companies for which the ESG composite and all three ESG component ratings from Bloomberg and Sustainalytics were available for any of the years between 2013 and 2018. Any company-year observation that did not have a complete set of ratings from both providers was excluded. We also excluded any company-year observation that did not have complete financial and market information to calculate the control and independent variables used in our analyses.

We then accessed data from SEC 13F and 13D/G filings available through the Refinitiv Database to match institutional holding and blockholder holding data to each company-year observation. Investment managers with at least USD 100 million in assets under management are required to file form 13F, listing their equity ownership stakes (17 CFR § 240.13f-1). Additionally, anyone with a beneficial ownership stake of more than 5% of a publicly traded company's equity must file schedule 13D/G (17 CFR § 240.13d-1).

We use the number of 13F filers for a company to represent the number of institutional investors holding shares in that firm and the number of 13D/G filers to represent the number of blockholders. This is also the category into which activist shareholders would fall. We are careful to consider the ultimate or beneficial owner of the shares. That way, when an asset manager holds shares in different funds or managed accounts of the same company, we avoid double-counting the number of investors holding the company's shares. For our dataset, all blockholders are also institutional investors who are subject to filing form 13F. Therefore, we label any institutional investor with a beneficial ownership stake equal to or greater than 5% as a "blockholder" for the purpose of our analyses. In order to maintain a scale consistent with that of our other variables, we take the natural logarithm of the number of institutional investors and the natural logarithm of the number of blockholders plus one to account for

firms with zero blockholders. These data also allow us to calculate the percentage of common shares held by the Big Three asset managers (Blackrock, State Street, and Vanguard).

We then use the percentage of each institutional investor's portfolio allocated to a security, as reported in the Refinitiv database, to calculate the mean portion of the portfolio allocated by all asset managers holding that firm's security. Likewise, we filter for the Big Three asset managers and for investors with at least a 5% stake in order to calculate the mean portfolio allocation by the Big Three and blockholders, respectively.

Table 1 contains full descriptions and definitions of all the variables used in our analyses. Table 2a contains the screening steps and breakdowns of observations and years, while Table 2b provides summary statistics for the variables used in our regressions.

3.4 Main Results

We begin our analysis by examining the relative preferences of institutional investors for the three dimensions of ESG. Specifically, we look at how investors allocate their capital among companies by considering financial characteristics and ESG criteria. In addition to voice and complete exit, investors have the option to increase and decrease their holdings in response to the changing financial and ESG characteristics of their portfolio companies. Furthermore, we recognize the importance of voice to institutional investors (McCahery et al., 2016), and hypothesize that, among ESG criteria, strong governance structures are of paramount importance, as governance is the mechanism by which investors can voice their preferences for firm policy while considering long-term value creation and social and environmental sustainability goals. Therefore, we expect the governance dimension to be the most important factor in investors' choice of portfolio companies.

Across the two data providers we examine, we believe that the Bloomberg ESG disclosure indices are the most relevant. One reason is that Bloomberg provides the most objective set of ratings since they simply measure how much data along each dimension of ESG a company discloses. Given the difficulty of relying on one particular ESG rating provider, investors who are interested in these data should find companies that disclose the most data to be the most attractive. Another reason is based on our hypothesis that, in the absence of

standardized and comparable ESG ratings, investors will prefer to have the option of evaluating company ESG criteria themselves in order to supplement or complement third-party ESG ratings. Additionally (or alternatively), in the absence of mandatory ESG disclosure guidelines and objective ESG ratings, investors may view companies' self-disclosure of high levels of ESG data as a signal of high quality.[13]

3.4.1 Relative Emphasis of ESG Component Rankings

We recognize the divergence among ESG ratings and the difficulties of objectively measuring ESG (as discussed above). Thus, before examining the relative impact of the ESG components on institutional investor holdings, we begin our analysis by looking at how the ratings providers in our sample set weight the three subdimensions of ESG and the relative emphasis on each component in calculating the composite ratings. In order to do this, we regress the three component rankings of each ESG index onto the composite ranking. We use dummy variables to control for industry and year effects. This is particularly important because each of the ratings providers adjusts its ratings over time and tailors the ratings to each industry.

Table 3 presents the results of the regressions. The Bloomberg ratings show a clear emphasis on the environmental dimension and roughly equal weights on the social and governance dimensions. We find that the Bloomberg environmental rating accounts for twice as much as each of the social and governance dimensions in contributing to the composite ESG rating. On the other hand, the Sustainalytics ESG ratings emphasize the environmental and social dimensions equally, while the weight they attach to the governance dimension is about half of that applied to each of the other two dimensions.

The differences we find among the ratings illustrate the importance of considering—in the absence of a single objective measure for ESG criteria—multiple proxies in order to test the robustness of any analyses relying on one set of data on ESG (or any component dimension). Therefore, to continue with our analysis, we look across all three dimensions of both data providers.

[13] Evidence supporting this view was found in the analyses in chapter 2 of this thesis.

3.4.2 Institutional Investor Holdings and ESG

The next step in our analysis is to distinguish among investor preferences across the three dimensions of ESG. To estimate these preferences, we regress composite ESG ratings from all three rating providers, as well the environmental, social, and governance component scores, onto the number of institutional investors and 5% blockholders. For the Big Three asset managers, we consider the total percentage of outstanding shares that they owned. We also consider the average percentage portfolio allocations to each company by institutional investors generally and by blockholders and the Big Three in particular. These analyses are designed to test the extent to which investors are drawn to firms based on each component of ESG, and whether and which ESG characteristics affect investors' relative portfolio allocations.

We use a standard set of control variables. To control for firm size, we use the natural logarithm of the firm's market capitalization. To control for varying degrees of leverage, we use the ratio of total debt to assets. We use Tobin's Q as a control variable for the level of a firm's intangible assets, which previous research has shown to be correlated with a firm's environmental quality scores (see, for example, Dowell et al., 2000; Konar and Cohen, 2001). Tobin's Q is also highly correlated with the firm's book-to-market ratio, a widely quoted financial metric found to be related to financial performance (Fama and French, 1996, 2015; Carhart, 1997). We use return on assets as a measure of a firm's long-term profitability and dummy variables to control for industry-level and year effects. For details of the definitions and calculations of all the variables, see Table 1.

Table 4 presents the results of our regressions on the total number of institutional investors and ESG scores. The most important finding is that investors have a significant preference for firms with high ESG rankings. We conjecture that the coefficients on the composite rankings should relate to institutional investors' relative preferences for the three dimensions of ESG. For the rankings, the Bloomberg ESG scores are more strongly correlated with holdings than are the Sustainalytics ratings, and the governance scores are strongest among the ESG dimensions.

The fact that Bloomberg disclosure scores have the strongest relation to holdings may indicate that investors prefer holding companies with strong ESG disclosure records. We

consider two possible explanations for this result. First, since the Sustainalytics score also shows statistical significance, it may be the case that, second to ESG disclosure scores, investors prefer companies with high values-oriented qualities. Second, this supposition is reflected in the Sustainalytics rankings (see Eccles and Stroehle (2018) on the values-oriented versus value-based approach of ratings providers). Thus, the results are consistent with the relatively low impact of the financial metrics in our regressions on holdings data.

Next, we compare the coefficients on the component ratings in order to estimate the relative preferences of institutional investors among the three dimensions of ESG. First, for both the Bloomberg and the Sustainalytics ratings, the highest impact on holdings is from the governance dimension. The coefficient on the Bloomberg governance rating is more than twice that of the Bloomberg environmental rating, while the coefficient of the social rating lacks statistical significance. Second, the coefficient on the Sustainalytics governance rating is slightly higher than that of the Sustainalytics social rating, which, in turn, is slightly higher than that of the Sustainalytics environmental rating. Moreover, given the close range of the values of the coefficients on the Sustainalytics component ratings and the similar magnitudes of the standard deviations, one cannot clearly conclude that there is a relative preference among the ESG dimensions. Thus, the results from the Bloomberg ratings are quite clear: investors strongly prefer companies with high disclosure of governance data, followed by environmental data; and they appear indifferent to the disclosure of social data.

We find a strong relationship between institutional holdings and a firm's combined environmental, social and governance ratings. This is consistent with the findings of Dyck et al. (2019), but our analysis extends beyond the E and S dimensions of ESG. Furthermore, our result regarding the overwhelming importance of G to institutional investors is not inconsistent with Dyck et al.'s (2019) premise that institutional ownership drives increases in E and S over time. In fact, our results so far suggest that it is through investing in firms with high governance quality that investors are able to effectively drive increased E and S performance.

Table 5 presents our findings on whether the holdings of blockholders are driven by both the component and composite E, S and G ratings. We find that, although the regressions on the number of blockholders lack statistical significance, this result suggests that, with regard to ESG issues, there are likely to be differences between institutional investors generally and

blockholders. First, institutional investors are generally more likely to be strongly driven by ESG ratings. Consistent with our expectations, large blockholders and activist investors are less motivated by these ratings. To be sure, there is prior evidence indicating that some activist investors are driven by ESG and are able to create value by following an ESG-focused strategy (see Barko et al., 2018). However, it may be that our sample is not representative of such investors, who may be only a small minority of activist investors. Alternatively, it may be that such investors tend to rely more on their proprietary collection and evaluation of ESG data and less on the publicly disclosed ESG data and rankings. On the other hand, our results are consistent with Griffin (2020), who finds that the largest institutional investors rarely support shareholder proposals related to improving a firm's E and S quality, thus supporting the proposition that large investors care much less about ESG.

Table 6 presents our findings with respect to the ownership stakes of the Big Three asset managers. The trend is consistent with what we see from institutional investors generally. While the Big Three are drawn to all firms with higher ESG scores, they are most significantly drawn to firms with high G scores. Furthermore, the Bloomberg disclosure-based ESG scores are more significant than the Sustainalytics scores in determining the Big Three ownership stakes.

In Tables 7, 8, and 9, we regress on the mean portfolio allocation of institutional investors generally (Table 7), blockholders (Table 8), and the Big Three asset managers (Table 9). While Table 8 shows no convincing evidence that blockholder stakes are related to ESG, Table 7 shows a statistically significant negative relationship between E ratings and the size of the ownership stake taken by institutional investors. Table 9, meanwhile, shows that the Big Three asset managers actually invest more in companies with high E ratings.

Generally, the results of our regressions on numbers of institutional investors and portfolio allocations suggest that, while institutional investors are strongly motivated to invest in companies with high-quality ESG, this does not correlate with making large portfolio allocations. With the exception of the Big Three asset managers, investors interested in taking a larger ownership stake are actually demotivated by high ESG scores, particularly E scores. This result may indicate the efforts of activist and value investors to identify undervalued companies with poor ESG performance, as described by Barko et al. (2018), and related to the idea of governance arbitrage which was proposed by Gilson and Gordon (2013) and

extended to ESG generally by Christie (2021). At the same time, it may also be evidence of the overpricing of companies with high ESG ratings – driven by attention from very large investors who are well-diversified against firm-specific risks due to their extensive shareholdings across the economy and who, instead, are more focused on reducing systemic risk exposure in their portfolios (Gordon, 2022).

Mutual fund and Hedge fund carveouts

As an additional set of tests to dig deeper into the potential differences among various institutional investors, we repeat our regressions on ownership characteristics using data on the holdings of institutional investors classified by Refinitiv as mutual funds and hedge funds. The panels in Table 10 show the results of these regressions.

The analyses of hedge funds show no clear relationship with ESG when considering the number of institutions investing in a firm. However, we do find evidence that hedge funds underweight firms with high ESG scores. The analyses of mutual funds show that, like institutional investors generally, they are attracted to firms with high ESG scores. There is however a difference for mutual funds as the relationship between their holdings and ESG does not extend to deciding how much of their portfolio weights are given to specific firms with high ESG scores.

3.4.3 Relationship of ESG with Financial Performance and Systemic Risk

We turn next to the effect of ESG factors on financial performance in order to determine whether it might explain the trends that we notice with respect to ownership. In this section, we assess the relationship between ESG composite and component scores against several measures of financial performance.

As discussed in Section 2, a factor likely to influence the link between ESG ratings and investor holdings is the degree to which a subsector of investors has a nonpecuniary component of utility (Fama and French, 2007). However, it may be that these investors are motivated not solely by ESG considerations, but also by the possibility that ESG is correlated with firms' financial performance. Indeed, the survey literature suggests that most

institutional investors take ESG factors into account because they believe them to be linked to financial performance (Amel-Zadeh and Serafeim, 2017). It is, therefore, important that we understand how each component of ESG correlates with financial performance.

One possibility is that company investments in ESG criteria have positive externalities affecting financial performance, or, conversely, that investments with a pure profit motivation may have positive ESG-related externalities. An example of the first case would be if a firm were to invest in energy-saving technologies to reduce its carbon footprint, thus creating a positive externality of lowering the firm's energy costs. In the second case, it is possible, and perhaps even more likely, that a firm may invest in green technologies with the purely financial motive of reducing costs, but the investment may incidentally improve its environmental rating. Investors can recognize such effects and see ESG characteristics as proxies for gauging a firm's financial prospects. Dowell et al. (2000) argue that investors see positive environmental performance as a sign of a high-quality company. Evidence also suggests that firms with better environmental performance have higher intangible-asset valuations, which may indicate positive technological spillover from green investments (Konar and Cohen, 2001).

Another possible link between ESG and firms' financial performance is the combined effects of a sufficiently large number of investors acting on nonfinancial motives to slant their portfolios towards firms with strong ESG criteria and away from firms with poorer ESG quality. While these investors are motivated, at least in part, by nonfinancial factors, if a sufficiently large number of investors act in a similar fashion, fewer investors will be willing to hold poor-quality ESG firms. As a result, it will be harder to diversify the risk of holding these poor-quality ESG firms, and those remaining investors willing to hold these firms' securities will demand higher risk premia to compensate them for reduced diversification possibilities. The subset of investors acting this way needs to be just large enough to raise the cost of capital for firms with poor ESG quality in order to provide a financial incentive to invest in improving ESG quality and, thus, to attract a larger number of investors (see Heinkel et al., 2001).

A third possible explanation for a positive relationship between ESG and financial performance involves considering the risk benefits that may accrue to individual firms due to their ESG characteristics, as well as the diversification benefits related to firms' ESG

characteristics. This would explain why some strands of the literature argue for the need to consider the financial performance impacts of ESG factors at the portfolio level. Some of this literature argues that portfolio performance depends on how ESG is used in constructing an investment portfolio (Statman and Glushkov, 2008). These studies find that improved financial performance depends on how the portfolio manager uses ESG screenings. Barnett and Salomon (2006), for example, find that the link between performance and ESG depends on how a fund manager applies ESG criteria; they also find that positive returns depend on using ESG considerations to weight portfolios away from poor-quality ESG companies rather than using ESG as an absolute screening method to completely exclude them. Sherwood and Pollard (2018) and Hanson et al. (2017) argue that ESG can be used to diversify risks in portfolio construction. Consistent with that view, Barnett and Salomon (2006), Shafer and Szado (2019), and Hanson et al. (2017) find evidence that ESG can be important in managing tail risks. Hoepner et al. (2019) and Bialkowski and Starks (2016) also find some evidence that ESG factors are negatively related to extreme downside risks.[14]

What explains the relevance of ESG factors to a company's risk exposure? A company may invest in lowering its carbon footprint and improving its environmental impact as a way to avoid environmental fines and regulations in the present. However, by investing to improve its environment credentials even further, the company is also hedging against the possibility of more-stringent future environmental regulations. In the same vein, similar to the relationship between a firm's environmental quality and performance, a firm may be able to generate positive financial returns, or at least hedge against potential risks, by investing in improving "social" criteria. Doing so would help the firm avoid or limit the risk of controversy and poor publicity (i.e., reputational risk), as well as the risk of litigation related to negative "social" behavior, such as discriminatory employment practices, health and safety violations, and labor law violations. Similarly, a firm's investments in better corporate governance structures and mechanisms may, through improved firm governance and oversight, enhance its financial performance by reducing the risks of agency problems and rent-seeking behavior by management, as well as the possibility of corporate fraud and other scandals.

[14] This is also consistent with the evidence from Gisbon et al. (2019) and chapter 2 of this thesis showing that the relationship between ESG and financial performance is attributable primarily to the decreased risk of securities with high ESG scores.

In order to tease out these multiple effects on financial performance, we test the relationship between ESG composite and component scores against several measures of financial performance. In Table 11, we examine the relationship between ESG and a security's risk-return tradeoff, as measured by its Sharpe ratio. Table 12 examines a security's exposure to systemic risk, as measured by CAPM beta. And Table 13 examines the extent to which ESG ratings may be related to a security being undervalued or overvalued based on the security's alpha.

For all regressions, we use the following independent variables: to control for size, we use the natural logarithm of the firm's market capitalization; to control for varying degrees of leverage, we use the ratio of total debt to assets. We use Tobin's Q as a control variable for the level of a firm's intangible assets, which previous research has shown to be correlated with a firm's environmental quality scores (see, for example, Dowell et al., 2000; Konar and Cohen, 2001). This relationship between intangible assets and environmental quality is due, in part, to firms in certain industries (e.g., internet companies) having a lower carbon footprint simply because of the nature of their operations. Furthermore, firms that invest in more-efficient technologies often develop technologies that are not only more cost-effective but that also have smaller carbon footprints. We use dummy variables to control for industry-level and year effects. This is particularly important, as ESG ratings are adjusted periodically and adapted to each industry.

The regression results on Sharpe ratios in Table 11 show generally positive relationships with ESG, though the relationship is greatest and most statistically significant with the governance dimension. The relationship with Bloomberg ESG disclosure ratings is stronger than with the subjective Sustainalytics ratings. This trend is largely consistent with what we have seen when looking at investor preferences across E, S, and G.

Table 12 considers whether there is a correlation between ESG and general market risk or systemic risk, as measured by CAPM beta. The main point here is that there is strong evidence of a statistically significant negative relationship between ESG and systemic risk, primarily along the governance dimension, but also along the social dimension. While this result is robust for both the Bloomberg and Sustainalytics ratings, the results are stronger for the Bloomberg ratings. This is, perhaps, because these ratings are a measure of information content and are relatively objective. It could also be that the companies that disclose more

ESG data, as measured by the Bloomberg ratings, happen to disclose more information generally, which provides investors with more information and helps to minimize exposure to risk.[15]

Next, we investigate the potential relationship between ESG and alpha in order to determine whether ESG is correlated with a security being undervalued or overvalued. Table 13 presents the results of this analysis. By regressing on alpha, we find evidence that securities with high E ratings tend to have lower alphas, implying that they are relatively overvalued, while securities with high G and S ratings tend to have higher alphas and are relatively undervalued.

These findings help to explain investors' portfolio allocations. They prefer G because it is most correlated with superior risk-return tradeoffs (high Sharpe ratios) and low exposure to systemic risk (low betas); and securities of companies with high G ratings are potentially undervalued (high alphas). Meanwhile, investors move away from companies with high E because they are relatively overvalued (low alphas). The exception is the Big Three asset managers, who actually invest more in E, which may actually be creating the overvaluations since they are such large investors.

In general, our results on the connections between ESG and financial performance in Tables 11, 12, and 13 support the portfolio-optimization strand of the literature, which argues that ESG filters can help to construct a portfolio with superior financial performance (Sherwood and Pollard, 2018; Bannier et al., 2019 Hanson et al., 2017; Boze et al., 2019).

Furthermore, our evidence suggests that the effect seems to be most pronounced on the risk side—volatility and beta—consistent with the literature suggesting that ESG is a hedge against extreme events. As Hoepner et al. (2019) show, ESG investing helps limit downside risk in extreme situations. Similarly, Shafer and Szado (2019) show, by analyzing volatility surfaces, that options markets price with a lower probability that firms with better ESG quality are exposed to "left-tail" events and extreme downside risk. This is likely because firms' investments in ESG can provide a "hedge" against regulatory risk (more-stringent standards help prevent future environmental and health and safety issues); against litigation

[15] See chapter 2 of this thesis.

risk (by having a more diverse workforce and better governance oversight); against reputational risk (thanks to an enhanced public image through supporting environmental and social sustainability causes); and, finally, against the risk of corporate scandals (strong corporate governance mechanisms in place can help to deter and catch fraud and malfeasance[16]).

3.4.4 Principal Component Analysis of ESG Scores

Due to the high correlation among ESG component ratings (see Table 2c), we employ a principal component analysis in order to confirm our results. Table 14 panel A presents the results of a principal components analysis of the Bloomberg environmental, social, and governance scores along with their loadings and explained variance. We note that the Bloomberg environmental score loads mostly on the third principal component (PC3), the social score mostly on the second principal component (PC2), and the governance score mostly on the first principal component (PC1). We also note that the first principal component, where governance is mostly loaded, explains 78.9% of the variance among these ratings.

We then use the first principal component of the Bloomberg scores (BBG_PC1), on which governance is most heavily loaded as an independent variable in our regression analysis in place of the ESG scores. Table 14 panel B shows the results of these regressions examining the relationship of the first principal component of the Bloomberg ESG scores (BBG_PC1) to various institutional investor holdings characteristics and financial performance measures. As the Bloomberg governance score is loaded mostly on this component, the results of these regressions confirm our previous results with respect to the impact of governance versus social and environmental scores.

We follow the same procedure as we did in Panels A and B and carry out the principal component analysis and regressions now using the Sustainalytics ESG scores. Table 14 panel C presents the principal components of the Sustainalytics environmental, social, and governance scores along with their loadings and explained variance. The results show that the Sustainalytics environmental score loads mostly on the third principal component (PC3), the

[16] See chapter 5 of this thesis.

social score mostly on the first principal component (PC1) but also substantially on the second principal component (PC2), and the governance score loads mostly on the first principal component (PC1) with negative loadings on the other principal components. We also note that the first principal component (PC1), where governance is mostly loaded, explains 66.73% of the variance among these ratings.

A principal component regression using the first component of the Sustainalytics ESG scores (Sustainalytics_PC1) as an independent variable and various institutional investor holdings characteristics and financial performance measures appears in Table 14 panel D. The results of these regressions help to confirm our previous results.

3.4.5 Investor Preferences and Greenhouse Gas Emissions

An interesting question remains about whether there is a relation between corporate carbon emissions and large shareholders. From a policy standpoint, an important question is whether institutional investors' ownership can affect the carbon emissions of investee companies. For a number of reasons, we may expect a different effect for large shareholders. One possibility is that the holdings of large investors might indirectly influence firms' efforts to reduce carbon emissions (Gianfrante et al., 2021). Another reason that we might expect to see holdings related to carbon emissions is that if investors hold a significant ownership stake, they may be able to reduce the carbon emissions of investee companies (Azar et al., 2021).

The results, presented in Table 15, show that there is no evidence of a statistically significant connection between carbon emissions and institutional investors generally or blockholders in particular; however, there is a positive relationship with ownership by the Big Three asset managers. The fact that the Big Three own large stakes in high-carbon-producing firms is consistent with the findings of Azar et al. (2021). The results may be explained by the limited ability of large shareholders' ownership stakes to influence the carbon emissions of their investee companies (Gianfrante et al., 2021).

Finally, the evidence in this section highlights the relationship with financial performance and explains, in part, the large ESG-driven nature of institutional holdings, despite these two facts: governance is the most significant subdimension when analyzing holdings and financial

performance; and ESG disclosure is generally more significant than ESG quality. While a large number of these investors appear to be driven by nonfinancial, ESG considerations, the situation can clearly arise in which these investors overinflate the price of securities with high ESG characteristics. This lowers firms' costs of capital (Heinkel et al., 2001) but can contribute to an unsustainable bubble if it is detached from financial performance considerations. This would especially be the case if investors' preferences for ESG characteristics were cyclical and income-elastic (as suggested by Bansal et al. (2018), who argue that ESG investing is a luxury good and that investor demand for ESG is dependent on disposable income levels); then, the shares of such companies would be particularly exposed to devaluation in the case of a recession. On the other hand, the fact that portfolio allocations of institutional investors are negatively correlated with ESG criteria lends support to the argument that activist investors may seek out companies with poor ESG criteria as a way to find companies that are also underperforming financially (Barko et al., 2018). This, too, is consistent with Griffin's (2020) empirical findings.

3.5 Conclusion

In this paper, we examine the financial and nonpecuniary ESG preferences of institutional investors. Using a unique dataset, we focus our analysis on the SEC 13F and 13D/G filings of institutional investors and blockholders of US equities to test institutional investors' interest in companies. Moreover, we examine the extent to which institutional investors' allocations are driven by ESG rather than by companies' financial characteristics. The results show that institutional investors have a strong preference for investing in firms with strong ESG rankings, relative to other financial metrics and proxies for financial performance. The findings also show that when it comes to the size of the ownership stake, the relationship with ESG quality is negative. This study further suggests that high-quality ESG companies, particularly companies with high ratings in the environmental dimension, receive too much attention from large institutional investors and are in danger of being overvalued. These results lend support to the claims that activist investors are increasing their stakes in companies with poor ESG performance and that large institutional investors are seldom interested in advancing environmental- and social-related shareholder proposals.

We also find that institutional investors have a preference for ESG disclosure over the actual ESG quality of portfolio companies. Blockholders, on the other hand, appear much less interested in ESG than institutional investors generally are. We also find no evidence of a relationship between the holdings of large shareholders and carbon emissions. Upon considering the three dimensions of ESG, we find that governance factors trump social and environmental factors in determining institutional investors' interest. Again, company disclosure of governance criteria appears more important than actual governance quality rankings.

In addition, we examine the relationship between ESG and financial performance to determine whether institutional investors are, to an extent, overweighting ESG data. We find statistically significant evidence to support the view that ESG, and particularly the governance dimension, is related to decreased risk. Again, ESG disclosure scores are more strongly correlated with decreased risk than are subjective ESG quality rankings. We also show that the correlation between decreased risk and better governance ratings is stronger than for the social and environmental dimensions of ESG; furthermore, the governance disclosure scores are more strongly correlated than the governance quality rankings. This positive relationship between financial performance and ESG supports the argument that activist investors prefer to find value in companies that are underperforming financially and with respect to ESG; this helps to explain why ownership stake size is negatively correlated with high-quality ESG.

Overall, our results support recent evidence of the portfolio-optimization benefits of ESG. We also help to bridge a gap in the literature in two ways: by showing the relative impact of each of the three subfactors of ESG and by clearly distinguishing between the disclosure and quality of ESG. The results of this paper also contribute to the literature by shedding light on the ESG preferences of institutional investors.

3.6 Tables

Table 1 – variable definitions

This table provides definitions of the variables used in our data analyses.

Variable	Definition
BBG_ESG	This is a proprietary Bloomberg score based on the extent of a company's publicly disclosed ESG data. Scores range from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Bloomberg tailors the scoring to different industries. In this way, each company is evaluated only in terms of the data that are relevant to its industry sector. This score measures the amount of ESG data a company reports publicly and does not measure the company's performance on any data point. We divide this variable by 100 to facilitate comparisons in our models. Bloomberg field: "ESG_DISCLOSURE_SCORE"
BBG_environ	This is a proprietary Bloomberg score based on the extent of a company's environmental disclosure as part of ESG data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data related to the environment to 100 for those that disclose every data point collected by Bloomberg related to the environmental component of ESG. Bloomberg tailors the score to particular industries. In this way, each company is evaluated only in terms of the data that are relevant to its industry sector. This score measures the amount of environmental data a company reports publicly and does not measure the company's performance on any data point. We divide this variable by 100 to facilitate comparisons in our models. Bloomberg field: "ENVIRON_DISCLOSURE_SCORE"
BBG_social	This is a proprietary Bloomberg score based on the extent of a company's social disclosure as part of ESG data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data related to the social component of ESG to 100 for those that disclose every data point collected by Bloomberg related to social factors of ESG. Bloomberg tailors the score to particular industries. In this way, each company is evaluated only in terms of the data that are relevant to its industry sector. This score measures the amount of social data a company reports publicly and does not measure the company's performance on any data point. We divide this variable by 100

	to facilitate comparisons in our models. Bloomberg field: "SOCIAL_DISCLOSURE_SCORE"
BBG_govn	This is a proprietary Bloomberg score based on the extent of a company's governance disclosure as part of ESG data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data related to governance to 100 for those that disclose every data point collected by Bloomberg related to the governance component of ESG. Bloomberg tailors the score to particular industries. In this way, each company is evaluated only in terms of the data that are relevant to its industry sector. This score measures the amount of governance data a company reports publicly and does not measure the company's performance on any data point. We divide this variable by 100 to facilitate comparisons in our models. Bloomberg field: "GOVNCE_DISCLOSURE_SCORE"
Beta	Beta measures the percentage price change of the security given a one-percent change in a representative market index – here, the S&P 500 index is used. The beta value is determined by comparing the price movements of the security and the S&P 500 index for the past two years of weekly data. Bloomberg field: "EQY _BETA"
Alpha	Indication of the degree to which a stock is undervalued or overvalued in relation to other stocks with similar systemic risk. Bloomberg field: “EQY_ALPHA”
log (blockholders+1)	This is the natural logarithm of the number of 13D/G filers who have a beneficial ownership of at least 5% of a security plus one in order to account for firms with zero blockholders. The ultimate beneficial owner is used in order to avoid double counting in such cases when a security is held in multiple separate accounts.
mean proportion of blockholder portfolio	This represents the average proportion of blockholders’ portfolios (in percentage terms) invested in a company.
log (institutional_investors)	This is the natural logarithm of the number of 13F filers who disclose ownership of a company's common stock. An asset manager with at least USD 100 million in assets under management is required to disclose the securities it manages. We use the asset manager’s name in order to avoid double counting in cases when one asset manager holds securities in multiple separate accounts or funds.
mean proportion of institutional investor portfolio	This is the average proportion of institutional investor portfolios (in percentage terms) invested in the company.
Total Big 3 ownership	This is the percentage of all outstanding shares in a company owned by the Big Three asset managers (Blackrock, Vanguard, and Statestreet).

Big 3 mean proportion of portfolio	This is average proportion of portfiolios of the Big Three (in percentage terms) invested in the company.
log_mktcap	We use the natural logarithm of a company's market capitalization in order to control for relative size in our analyses. This corresponds to the natural logarithm of the Bloomberg field "HISTORICAL_MARKET_CAP".
ROA	As a control variable for company profitability, we use return on total assets. ROA is calculated as: (Trailing 12M Net Income / Average Total Assets). Bloomberg field: "RETURN_ON_ASSET"
Sharpe ratio	This variable represents the risk-return tradeoff of a security by considering the reward per unit of risk. It divides the return of the fund earned in excess of the risk- free rate by the standard deviation of the fund over a one- year time period. Bloomberg field: "EQY_SHARPE_RATIO"
Sustainalytics_ESG	Sustainalytics assigns a rank to the company based on its total ESG quality relative to its industry peers. Scores range from 0 to 100. Aggregate ESG performance encompasses a company's level of preparedness, disclosure and controversy involvement across all three ESG themes. Bloomberg field: "SUSTAINALYTICS_RANK"
Sustainalytics_environ	Sustainalytics assigns a rank for the company's management of its environmental record in relation to industry peers. Scores range from 0 to 100. Environmental performance is determined by the level of environmental preparedness and disclosure in addition to environmental controversies. Bloomberg field: "SUSTAINALYTICS_ENVIRONMENT_PCT"
Sustainalytics_social	Sustainalytics assigns a rank for the company's management of its social impact relative to industry peers. Scores range from 0 to 100. Social performance is determined by the quality of policies, programs and management systems concerning employees, suppliers, customers and society in addition to related controversies. Bloomberg field: "SUSTAINALYTICS_SOCIAL_PERCENTILE"
Sustainalytics_govn	Sustainalytics assigns a rank for the company's management of its governance activities in relation to industry peers. Scores range from 0 to 100. Bloomberg field: "SUSTAINALYTICS_GOVERNANCE_PCT"
Tobin_Q	We use Tobin's Q to control for the level of a firm's intangible assets. It is the ratio of the market value of a firm to the replacement cost of the firm's assets. The ratio is computed by Bloomberg as: (Market Cap + Total Liabilities + Preferred Equity + Minority Interest) / Total Assets. Bloomberg field: "TOBIN_Q_RATIO"

totDebt_to_assets	In order to control for leverage, we calculate the ratio of firm debt to market capitalization. This corresponds to the quotient of the Bloomberg fields "SHORT_AND_LONG_TERM_DEBT" / " BS_TOT_ASSET ".
Industry	In our regressions, we use industry dummies based on the first digit of the company's primary Standard Industrial Classification (SIC) code. Bloomberg field: "EQY_SIC_CODE".
Log_GHG_emissions	We use the natural log of the total greenhouse gas (GHG) emissions of the company in metric tons. Greenhouse gases are defined as those gases that contribute to the trapping of heat in the Earth's atmosphere and include Carbon Dioxide (CO2), Methane, and Nitrous Oxide. This includes scope 1 and scope 2 emissions. Scope 1 emissions are direct GHG emissions from sources that are owned or operated by the company. Sources include combustion facilities, company owned or operated transportation, and physical or chemical processes. Scope 2 emissions are indirect GHG emissions that are caused by the company through the consumption of imported heat, electricity, cooling, or steam. Bloomberg field: "TOTAL_GHG_CO2_EMISSIONS".

Table 2a – dataset summaries

This table shows the screening steps used in compiling our data and a breakdown of the observations by firms and years.

sample selection	distinct companies	firm-year observations
firms with all four Sustainalytics ESG ratings over 2013-2018	987	4297
remove firms missing any of the four Bloomberg ratings	658	3158
remove firms with incomplete or missing ownership data	549	2927
remove firms with incomplete or missing accounting or market data	523	2876

	number of companies	years per company	total observations
	17	3	51
	33	4	132
	145	5	725
	328	6	1968
total:	523		2876

Table 2b – summary statistics

This table presents summary statistics for all variables used in the analyses with the exception of year and industry dummy variables (n=2876 distinct company-year observations). Variables are winsorized at the 5% and 95% levels; regression results are robust to the 1% and 99% levels.

Variable	Mean	Minimum	Maximum	Std. Dev.
number of institutional investors	1034	433	3258	557.980
number of blockholders	3	0	8	1.205
mean proportion of total portfolio	4.381	0.436	27.586	7.345
mean proportion of blockholder portfolio	0.781	0.518	2.675	0.164
total Big 3 ownership	20.012	0.000	46.968	5.990
Big 3 mean proportion of portfolio	0.059	0.000	0.477	0.068
log_mktcap	9.980	7.036	13.580	1.038
Tobin_Q	2.182	0.626	9.985	1.256
totDebt_to_assets	0.304	0.000	0.847	0.159
ROA	0.057	-0.301	0.368	0.068
BBG_ESG	0.356	0.132	0.711	0.134
BBG_environ	0.267	0.014	0.736	0.180
BBG_social	0.317	0.031	0.734	0.143
BBG_govn	0.597	0.268	0.857	0.071
Sustainalytics_ESG	0.528	0.000	1.000	0.261
Sustainalytics_environ	0.506	0.000	1.000	0.282
Sustainalytics_social	0.510	0.000	1.000	0.270
Sustainalytics_govn	0.566	0.000	1.000	0.250
Sharpe ratio	0.754	-2.333	5.501	1.041
beta	1.029	-0.531	4.708	0.538
alpha	-0.040	-3.639	2.298	0.457
log_GHG_emissions	13.522	8.749	18.668	2.086

Table 2c – correlation matrix

This table shows correlation coefficients for all eight ESG composite and sub-indices. Statistical significance is denoted at the *10 percent, **5 percent, and ***1 percent levels. Definitions of all variables along with relevant calculations appear in Table 1.

	BBG ESG	BBG environ	BBG social	BBG govn	Sustainalytics ESG	Sustainalytics environ	Sustainalytics social	Sustainalytics govn
BBG ESG	-	0.9771***	0.8505***	0.7688***	0.6044***	0.5192***	0.5349***	0.4497***
BBG environ		-	0.738***	0.6979***	0.5915***	0.518***	0.5234***	0.4177***
BBG social			-	0.6126***	0.5064***	0.4046***	0.4642***	0.4272***
BBG govn				-	0.4326***	0.3694***	0.3719***	0.3541***
Sustainalytics ESG					-	0.8726***	0.8566***	0.6357***
Sustainalytics environ						-	0.6269***	0.4342***
Sustainalytics social							-	0.4327***

Table 3 – ESG composite and component rankings

This table shows the relative importance that each data provider gives the three components of ESG in its composite ESG rankings. We regress the component rankings of each ESG data provider onto the composite ranking. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable:	BBG_ESG		Sustainalytics_ESG
BBG_environ	0.5239***	Sustainalytics_environ	0.4631***
	(0.0017)		(0.0090)
BBG_social	0.2426***	Sustainalytics_social	0.4259***
	(0.0020)		(0.0095)
BBG_govn	0.2264***	Sustainalytics_govn	0.2366***
	(0.0036)		(0.0091)
Year effects	yes	Year effects	yes
Industry effects	yes	Industry effects	yes
n	2876	n	2876
R-squared	0.9786	R-squared	0.9392

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 4 – ESG and institutional investors

This table shows how the holdings of institutional investors are related to ESG scores and financial data. We regress component and composite ESG scores along with common financial data of companies onto the natural logarithm of the number of institutional investors. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: log number of institutional investors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	0.3818***	0.3814***	0.3894***	0.3824***	0.3848***	0.3868***	0.3864***	0.3932***	0.3789***	0.3889***
	(0.0110)	(0.0109)	(0.0105)	(0.0111)	(0.0105)	(0.0107)	(0.0104)	(0.0101)	(0.0112)	(0.0108)
Tobin_Q	-0.0387***	-0.0388***	-0.0391***	-0.0382***	-0.0425***	-0.0417***	-0.0411***	-0.0429***	-0.0387***	-0.0430***
	(0.0117)	(0.0117)	(0.0118)	(0.0117)	(0.0117)	(0.0118)	(0.0117)	(0.0117)	(0.0117)	(0.0117)
totDebt_to_assets	-0.0719	-0.0721	-0.0723	-0.0839	-0.0786	-0.0711	-0.0758	-0.0991	-0.0795	-0.0935
	(0.0678)	(0.0677)	(0.0683)	(0.0681)	(0.0677)	(0.0681)	(0.0678)	(0.0683)	(0.0681)	(0.0685)
ROA	0.3875*	0.3950**	0.3587*	0.3710*	0.3769*	0.3790*	0.3920**	0.3254	0.4016**	0.3575*
	(0.1990)	(0.1990)	(0.2000)	(0.1991)	(0.1985)	(0.2002)	(0.1991)	(0.1986)	(0.1994)	(0.2001)
BBG_ESG	0.2167**									
	(0.0880)									
BBG_environ		0.1662**							0.1732*	
		(0.0646)							(0.0954)	
BBG_social			0.0892						-0.1057	
			(0.0794)						(0.1086)	
BBG_govn				0.3710**					0.2102	
				(0.1700)					(0.2255)	
Sustainalytics_ESG					0.1191***					
					(0.0455)					
Sustainalytics_environ						0.0692				0.0039
						(0.0430)				(0.0508)
Sustainalytics_social							0.1057**			0.0658
							(0.0428)			(0.0529)
Sustainalytics_govn								0.1160***		0.0851*
								(0.0429)		(0.0487)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.8366	0.8369	0.8343	0.836	0.837	0.8349	0.8366	0.8372	0.8376	0.8381

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 5 – ESG and blockholders

This table shows how the holdings of blockholders with a minimum 5% stake in a company are related to ESG scores and financial data. We regress component and composite ESG scores along with common financial data of companies onto the natural logarithm of the number of investors with at least a 5% ownership stake. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: log number of blockholders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	-0.0731***	-0.0739***	-0.0724***	-0.0807***	-0.0733***	-0.0738***	-0.0744***	-0.0754***	-0.0794***	-0.0737***
	(0.0121)	(0.0121)	(0.0115)	(0.0121)	(0.0116)	(0.0118)	(0.0115)	(0.0112)	(0.0123)	(0.0120)
Tobin_Q	0.0305***	0.0307***	0.0300***	0.0326***	0.0310***	0.0312***	0.0310***	0.0311***	0.0319***	0.0311***
	(0.0110)	(0.0110)	(0.0109)	(0.0110)	(0.0109)	(0.0109)	(0.0109)	(0.0109)	(0.0110)	(0.0109)
totDebt_to_assets	-0.0192	-0.0196	-0.0175	-0.0248	-0.0182	-0.0193	-0.02	-0.0185	-0.0226	-0.0192
	(0.0724)	(0.0724)	(0.0724)	(0.0724)	(0.0724)	(0.0724)	(0.0724)	(0.0729)	(0.0723)	(0.0731)
ROA	-0.5160***	-0.5165***	-0.5150***	-0.5205***	-0.5108**	-0.5154***	-0.5157***	-0.5125**	-0.5208***	-0.5148**
	(0.1992)	(0.1992)	(0.1991)	(0.1991)	(0.1994)	(0.1992)	(0.1992)	(0.2002)	(0.1988)	(0.2005)
BBG_ESG	-0.0465									
	(0.0942)									
BBG_environ		-0.0227							-0.0348	
		(0.0697)							(0.1062)	
BBG_social			-0.0904						-0.183	
			(0.0850)						(0.1197)	
BBG_govn				0.2022					0.4703**	
				(0.1794)					(0.2361)	
Sustainalytics_ESG					-0.03					
					(0.0461)					
Sustainalytics_environ						-0.0192				-0.0161
						(0.0432)				(0.0557)
Sustainalytics_social							-0.015			-0.0047
							(0.0444)			(0.0568)
Sustainalytics_govn								-0.0103		-0.0009
								(0.0457)		(0.0520)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.1379	0.1377	0.1388	0.139	0.1381	0.1378	0.1378	0.1377	0.1433	0.1378

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 6 – ESG and ownership by the Big Three

This table shows how ownership by the Big Three asset managers (Blackrock, Vanguard, and Statestreet) is related to ESG scores. We regress component and composite ESG scores along with common financial data of companies onto the total percentage of outstanding shares owned by the Big Three combined. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: total Big 3 ownership

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	-1.7002***	-1.7095***	-1.4134***	-1.8040***	-1.4825***	-1.3157***	-1.4637***	-1.2142***	-1.9005***	-1.2797***
	(0.3219)	(0.3211)	(0.3102)	(0.3231)	(0.3103)	(0.3188)	(0.3060)	(0.2986)	(0.3276)	(0.3197)
Tobin_Q	-0.047	-0.0529	-0.0545	-0.0098	-0.1822	-0.1222	-0.1474	-0.1915	-0.0232	-0.1588
	(0.3431)	(0.3427)	(0.3476)	(0.3413)	(0.3468)	(0.3511)	(0.3449)	(0.3473)	(0.3409)	(0.3461)
totDebt_to_assets	2.1472	2.1394	2.1515	1.4936	1.9126	2.104	1.989	1.2925	1.6084	1.3585
	(1.9909)	(1.9887)	(2.0159)	(1.9828)	(2.0066)	(2.0288)	(2.0007)	(2.0260)	(1.9861)	(2.0200)
ROA	0.8266	1.1274	-0.3822	0.3086	0.1188	-0.2482	0.8076	-1.4899	1.1567	-0.5595
	(5.8468)	(5.8452)	(5.9074)	(5.8008)	(5.8833)	(5.9597)	(5.8792)	(5.8905)	(5.8129)	(5.8987)
BBG_ESG	9.4596***									
	(2.5858)									
BBG_environ		7.1372***							4.7924*	
		(1.8958)							(2.7797)	
BBG_social			5.1392**						-3.0729	
			(2.3444)						(3.1657)	
BBG_govn				20.9631***					16.6938**	
				(4.9535)					(6.5732)	
Sustainalytics_ESG					3.8428***					
					(1.3468)					
Sustainalytics_environ						0.9544				-2.0103
						(1.2793)				(1.4978)
Sustainalytics_social							3.5488***			3.9092**
							(1.2722)			(1.5588)
Sustainalytics_govn								3.9868***		2.5385*
								(1.2633)		(1.4346)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.176	0.1779	0.1554	0.1865	0.1635	0.1448	0.1679	0.1627	0.1937	0.1782

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 7 – ESG and portfolio allocations of institutional investors

This table shows how the portfolio allocations of institutional investors in companies are related to ESG characteristics. We regress component and composite ESG scores along with common financial data of companies onto the mean percentage of institutional investor portfolios invested in the companies. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: mean proportion of total portfolio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	-0.4015***	-0.3919***	-0.4320***	-0.4231***	-0.4088***	-0.3960***	-0.4187***	-0.4317***	-0.3995***	-0.3943***
	(0.0396)	(0.0394)	(0.0379)	(0.0402)	(0.0378)	(0.0383)	(0.0376)	(0.0366)	(0.0402)	(0.0391)
Tobin_Q	0.0352	0.0348	0.0385	0.0371	0.0461	0.0504	0.0411	0.0415	0.0411	0.0499
	(0.0422)	(0.0420)	(0.0425)	(0.0425)	(0.0423)	(0.0421)	(0.0423)	(0.0426)	(0.0418)	(0.0424)
totDebt_to_assets	0.0642	0.0512	0.0956	0.0967	0.089	0.0592	0.0867	0.1148	-0.0921	-0.1022
	(0.2763)	(0.2752)	(0.2775)	(0.2773)	(0.2755)	(0.2744)	(0.2766)	(0.2783)	(0.2435)	(0.2472)
ROA	-0.0735	-0.1273	0.0208	0.0063	-0.0468	-0.1303	-0.0572	0.0488	-0.2392	-0.1809
	(0.7193)	(0.7169)	(0.7215)	(0.7217)	(0.7173)	(0.7150)	(0.7215)	(0.7218)	(0.7127)	(0.7219)
BBG_ESG	-0.6091*									
	(0.3181)									
BBG_environ		-0.5964**							-1.2353***	
		(0.2325)							(0.3408)	
BBG_social			0.0271						0.8246**	
			(0.2864)						(0.3881)	
BBG_govn				-0.2731					0.7884	
				(0.6165)					(0.8059)	
Sustainalytics_ESG					-0.3487**					
					(0.1643)					
Sustainalytics_environ						-0.4364***				-0.4557**
						(0.1535)				(0.1833)
Sustainalytics_social							-0.2164			-0.0048
							(0.1551)			(0.1908)
Sustainalytics_govn								-0.1103		0.0597
								(0.1560)		(0.1756)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.3535	0.359	0.3467	0.3471	0.3553	0.3617	0.3504	0.3478	0.342	0.3317

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 8 – ESG and portfolio allocations of blockholders

This table shows how the portfolio allocations of blockholders in companies are related to ESG characteristics. We regress component and composite ESG scores along with common financial data of companies onto the mean percentage of blockholder portfolios invested in the companies. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: mean proportion of blockholder portfolio										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	-0.0492***	-0.0496***	-0.0504***	-0.0503***	-0.0509***	-0.0507***	-0.0517***	-0.0525***	-0.0498***	-0.0505***
	(0.0058)	(0.0058)	(0.0055)	(0.0058)	(0.0056)	(0.0056)	(0.0056)	(0.0053)	(0.0060)	(0.0057)
Tobin_Q	0.0061	0.0062	0.0062	0.0063	0.0069	0.007	0.0069	0.0069	0.0061	0.0071
	(0.0052)	(0.0052)	(0.0052)	(0.0052)	(0.0051)	(0.0051)	(0.0051)	(0.0051)	(0.0052)	(0.0051)
totDebt_to_assets	0.0648*	0.0647*	0.0649*	0.0647*	0.0649*	0.0646*	0.0636*	0.0642*	0.0651*	0.0635*
	(0.0341)	(0.0341)	(0.0341)	(0.0341)	(0.0341)	(0.0341)	(0.0341)	(0.0344)	(0.0341)	(0.0344)
ROA	-0.0487	-0.0495	-0.0493	-0.0498	-0.0456	-0.048	-0.0499	-0.0495	-0.049	-0.0503
	(0.0956)	(0.0956)	(0.0956)	(0.0956)	(0.0958)	(0.0957)	(0.0957)	(0.0961)	(0.0957)	(0.0962)
BBG_ESG	-0.0402*									
	(0.0218)									
BBG_environ		-0.0409							-0.014	
		(0.0333)							(0.0508)	
BBG_social			-0.0583						-0.0455	
			(0.0404)						(0.0570)	
BBG_govn				-0.0804					-0.0041	
				(0.0855)					(0.1135)	
Sustainalytics_ESG					-0.0215					
					(0.0219)					
Sustainalytics_environ						-0.021				-0.0246
						(0.0205)				(0.0267)
Sustainalytics_social							-0.0111			0.0019
							(0.0212)			(0.0273)
Sustainalytics_govn								-0.0047		0.0058
								(0.0216)		(0.0246)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.1724	0.1725	0.1717	0.1715	0.1759	0.1749	0.1748	0.1743	0.1737	0.1726

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 9 – ESG and portfolio allocations of the Big Three

This table shows how the portfolio allocations of the Big Three asset managers (Blackrock, Vanguard, and Statestreet) in companies are related to ESG characteristics. We regress component and composite ESG scores along with common financial data of companies onto the mean percentage of portfolios of the Big Three invested in the companies. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: Big 3 mean proportion of portfolio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	0.0505***	0.0498***	0.0517***	0.0518***	0.0508***	0.0506***	0.0514***	0.0516***	0.0505***	0.0513***
	(0.0024)	(0.0024)	(0.0023)	(0.0024)	(0.0023)	(0.0023)	(0.0022)	(0.0022)	(0.0024)	(0.0023)
Tobin_Q	-0.0009	-0.0009	-0.0011	-0.0011	-0.0013	-0.0014	-0.0011	-0.0014	-0.0013	-0.0017
	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
totDebt_to_assets	-0.0185	-0.0177	-0.0198	-0.0195	-0.0194	-0.0186	-0.0195	-0.022	-0.0159	-0.0217
	(0.0165)	(0.0164)	(0.0165)	(0.0165)	(0.0165)	(0.0165)	(0.0165)	(0.0165)	(0.0164)	(0.0166)
ROA	0.0855**	0.0887**	0.0821*	0.0819*	0.0844**	0.0863**	0.0827*	0.0788*	0.0936**	0.0783*
	(0.0429)	(0.0428)	(0.0429)	(0.0429)	(0.0429)	(0.0429)	(0.0430)	(0.0428)	(0.0426)	(0.0432)
BBG_ESG	0.0202									
	(0.0190)									
BBG_environ		0.0255*							0.0645***	
		(0.0139)							(0.0204)	
BBG_social			-0.007						-0.0418*	
			(0.0170)						(0.0232)	
BBG_govn				-0.0103					-0.0671	
				(0.0366)					(0.0480)	
Sustainalytics_ESG					0.0108					
					(0.0098)					
Sustainalytics_environ						0.0114				0.0122
						(0.0092)				-0.011
Sustainalytics_social							0.0009			(0.0125)
							(0.0092)			-0.0114
Sustainalytics_govn								0.0146		0.0157
								(0.0092)		(0.0105)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.646	0.6483	0.645	0.6449	0.646	0.6464	0.6448	0.6474	0.6532	0.6471

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 10 – Hedge fund and mutual fund ownership

The panels below present the results of robustness checks of our analyses with respect to investor type classifications. Panels A through D repeat regressions on ownership and portfolio weights using institutional investors classified as hedge funds and mutual funds by Refinitiv. In all regressions, dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

Panel A: hedge fund ownership

dependent variable: total ownership by HFs										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	-1.487***	-1.497***	-1.468***	-1.385***	-1.478***	-1.498***	-1.444***	-1.442***	-1.425***	-1.465***
	(0.2213)	(0.2211)	(0.2108)	(0.2235)	(0.2120)	(0.2155)	(0.2097)	(0.2039)	(0.2270)	(0.2200)
Tobin_Q	-0.5810**	-0.5805**	-0.5805**	-0.5956**	-0.5966**	-0.6041**	-0.5851**	-0.6020**	-0.5955**	-0.6192***
	(0.2363)	(0.2363)	(0.2365)	(0.2366)	(0.2370)	(0.2374)	(0.2364)	(0.2373)	(0.2367)	(0.2387)
totDebt_to_assets	0.5218	0.5165	0.5354	0.5679	0.4901	0.5503	0.5128	0.3814	0.7165	0.4657
	(1.4190)	(1.4190)	(1.4210)	(1.4210)	(1.4200)	(1.4200)	(1.4210)	(1.4310)	(1.4280)	(1.4400)
ROA	5.398	5.456	5.299	5.174	5.356	5.484	5.256	5.121	5.486	5.127
	(4.0170)	(4.0200)	(4.0090)	(4.0100)	(4.0110)	(4.0170)	(4.0200)	(4.0130)	(4.0250)	(4.0510)
BBG_ESG	0.858									
	(1.7800)									
BBG_environ		0.7793							1.881	
		(1.3050)							(1.9330)	
BBG_social			0.6741						0.8104	
			(1.6030)						(2.2190)	
BBG_govn				-2.29					-6.413	
				(3.4410)					(4.5860)	
Sustainalytics_ESG					0.4993					
					(0.9179)					
Sustainalytics_environ						0.6363				0.8115
						(0.8629)				(1.0370)
Sustainalytics_social							-0.04183			-0.7722
							(0.8715)			(1.0930)
Sustainalytics_govn								0.5887		0.64
								(0.8671)		(0.9893)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.3513	0.3516	0.3512	0.3517	0.3515	0.3519	0.3509	0.3518	0.3515	0.3494

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Panel B: mutual fund ownership

dependent variable: total ownership by MFs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	-2.002***	-1.953***	-1.855***	-2.161***	-1.695***	-1.505***	-1.733***	-1.620***	-2.145***	-1.453***
	(0.4001)	(0.4005)	(0.3813)	(0.4015)	(0.3865)	(0.3925)	(0.3814)	(0.3707)	(0.4085)	(0.3976)
Tobin_Q	0.9855**	0.9767**	0.9941**	1.032**	0.9237**	0.9914**	0.9271**	0.8821**	1.038**	0.9637**
	(0.4273)	(0.4281)	(0.4277)	(0.4249)	(0.4319)	(0.4323)	(0.4300)	(0.4315)	(0.4260)	(0.4313)
totDebt_to_assets	-0.4503	-0.5135	-0.3056	-1.049	-0.5912	-0.6518	-0.6548	-1.046	-0.9171	-1.498
	(2.5660)	(2.5710)	(2.5690)	(2.5530)	(2.5870)	(2.5850)	(2.5840)	(2.5030)	(2.5700)	(2.6030)
ROA	-22.92***	-22.89***	-23.77***	-23.23***	-23.89***	-24.59***	-23.47***	-24.63***	-23.40***	-25.09***
	(7.2630)	(7.2840)	(7.2520)	(7.2020)	(7.3100)	(7.3160)	(7.3130)	(7.2970)	(7.2440)	(7.3210)
BBG_ESG	7.621**									
	(3.2170)									
BBG_environ		4.882**							-0.9067	
		(2.3650)							(3.4790)	
BBG_social			6.629**						2.626	
			(2.8990)						(3.9940)	
BBG_govn				19.79***					18.13**	
				(6.1800)					(8.2560)	
Sustainalytics_ESG					0.9645					
					(1.6730)					
Sustainalytics_environ						-1.589				-3.959**
						(1.5720)				(1.8740)
Sustainalytics_social							1.7750			2.791
							(1.5850)			(1.9760)
Sustainalytics_govn								2.252		2.445
								(1.5770)		(1.7880)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.1008	0.0972	0.0998	0.1131	0.0865	0.0884	0.089	0.0912	0.1089	0.0987

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Panel C: hedge fund portfolio weightings

dependent variable: HFs mean proportion of portfolio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	0.07221***	0.07429***	0.05299**	0.06697***	0.05871**	0.06009**	0.05274**	0.04326*	0.07766***	0.05874**
	(0.0248)	(0.0247)	(0.0238)	(0.0252)	(0.0239)	(0.0243)	(0.0237)	(0.0231)	(0.0254)	(0.0248)
Tobin_Q	0.03301	0.03311	0.03412	0.03233	0.04122	0.04185	0.03768	0.03983	0.03327	0.04255
	(0.0264)	(0.0264)	(0.0267)	(0.0266)	(0.0267)	(0.0268)	(0.0267)	(0.0268)	(0.0265)	(0.0269)
totDebt_to_assets	0.05039	0.05453	0.04822	0.07976	0.06754	0.04579	0.0672	0.08742	0.06918	0.06369
	(0.1588)	(0.1584)	(0.1604)	(0.1599)	(0.1597)	(0.1599)	(0.1603)	(0.1618)	(0.1597)	(0.1623)
ROA	-0.2915	-0.3147	-0.216	-0.2403	-0.2445	-0.2711	-0.2558	-0.1707	-0.3306	-0.2576
	(0.4495)	(0.4489)	(0.4528)	(0.4512)	(0.4512)	(0.4526)	(0.4537)	(0.4537)	(0.4501)	(0.4565)
BBG_ESG	-0.5825***									
	(0.1991)									
BBG_environ		-0.4617***							-0.5244**	
		(0.1457)							(0.2161)	
BBG_social			-0.2676						0.2309	
			(0.1810)						(0.2481)	
BBG_govn				-0.8595**					-0.2613	
				(0.3872)					(0.5129)	
Sustainalytics_ESG					-0.2307**					
					(0.1032)					
Sustainalytics_environ						-0.1974**				-0.1512
						(0.0972)				(0.1168)
Sustainalytics_social							-0.156			-0.04909
							(0.0984)			(0.1232)
Sustainalytics_govn								-0.1335		-0.05551
								(0.0980)		(0.1115)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.1629	0.1665	0.1468	0.1538	0.154	0.1518	0.1477	0.146	0.1639	0.1482

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Panel D: mutual fund portfolio weightings

dependent variable: MFs mean proportion of portfolio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log_mktcap	0.07063***	0.07091***	0.06904***	0.06869***	0.06982***	0.07158***	0.06851***	0.06845***	0.07003***	0.07141***
	(0.0051)	(0.0051)	(0.0049)	(0.0052)	(0.0049)	(0.0050)	(0.0049)	(0.0047)	(0.0053)	(0.0051)
Tobin_Q	0.01529***	0.01529***	0.01540***	0.01549***	0.01600***	0.01664***	0.01554***	0.01562***	0.01558***	0.01670***
	(0.0055)	(0.0055)	(0.0055)	(0.0055)	(0.0055)	(0.0055)	(0.0055)	(0.0055)	(0.0055)	(0.0055)
totDebt_to_assets	-0.0214	-0.0211	-0.0214	-0.0206	-0.0199	-0.0232	-0.0207	-0.0201	-0.0229	-0.0267
	(0.0330)	(0.0330)	(0.0331)	(0.0331)	(0.0330)	(0.0329)	(0.0331)	(0.0333)	(0.0332)	(0.0333)
ROA	-0.0237	-0.0259	-0.0178	-0.0174	-0.0207	-0.0299	-0.0172	-0.0162	-0.0285	-0.0278
	(0.0933)	(0.0934)	(0.0933)	(0.0934)	(0.0932)	(0.0930)	(0.0935)	(0.0934)	(0.0936)	(0.0937)
BBG_ESG	-0.0448									
	(0.0413)									
BBG_environ		-0.0373							-0.0652	
		(0.0303)							(0.0450)	
BBG_social			-0.0172						0.0144	
			(0.0373)						(0.0516)	
BBG_govn				-0.00825					0.0834	
				(0.0801)					(0.1067)	
Sustainalytics_ESG					-0.0213					
					(0.0213)					
Sustainalytics_environ						-0.0383*				-0.0539**
						(0.0200)				(0.0240)
Sustainalytics_social							-0.0007			0.0262
							(0.0203)			(0.0253)
Sustainalytics_govn								-0.0033		0.0047
								(0.0202)		(0.0229)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.4526	0.4532	0.451	0.4507	0.4523	0.4567	0.4507	0.4507	0.4513	0.4558

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 11 – ESG and risk-return tradeoffs (Sharpe ratios)

This table shows the relationship between ESG scores and the risk-return tradeoff of a company's securities measured by the Sharpe ratio. We regress component and composite ESG scores onto Sharpe ratios while controlling for common financial characteristics. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: Sharpe ratio										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Tobin_Q	0.1425***	0.1411***	0.1447***	0.1423***	0.1406***	0.1404***	0.1400***	0.1399***	0.1425***	0.1378***
	(0.0272)	(0.0272)	(0.0271)	(0.0272)	(0.0269)	(0.0270)	(0.0269)	(0.0270)	(0.0272)	(0.0270)
log_mktcap	0.1604***	0.1654***	0.1552***	0.1609***	0.1689***	0.1646***	0.1758***	0.1667***	0.1662***	0.1731***
	(0.0333)	(0.0333)	(0.0317)	(0.0332)	(0.0320)	(0.0324)	(0.0317)	(0.0306)	(0.0339)	(0.0329)
totDebt_to_assets	-0.3056	-0.303	-0.3123	-0.3069	-0.3001	-0.3045	-0.2967	-0.3185	-0.3092	-0.3287
	(0.2005)	(0.2005)	(0.2003)	(0.2006)	(0.2007)	(0.2006)	(0.2003)	(0.2017)	(0.2005)	(0.2017)
BBG_ESG	0.5471**									
	(0.2452)									
BBG_environ		0.3499*							-0.3397	
		(0.1827)							(0.2931)	
BBG_social			0.5498**						0.5983*	
			(0.2308)						(0.3284)	
BBG_govn				0.9969**					0.1031	
				(0.4587)					(0.6309)	
Sustainalytics_ESG					0.2090*					
					(0.1251)					
Sustainalytics_environ						0.0793				0.1175
						(0.1219)				(0.1519)
Sustainalytics_social							0.1092			-0.252
							(0.1286)			(0.1550)
Sustainalytics_govn								0.2824**		0.1462
								(0.1158)		(0.1421)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.2429	0.2426	0.2445	0.2428	0.2426	0.2427	0.2434	0.243	0.2457	0.2453

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 12 – ESG and systemic risk (beta)

This table shows the relationship between ESG scores and a security's exposure to systemic risk as measured by beta. We regress component and composite ESG scores along with common financial characteristics of companies onto a security's beta. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: beta

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Tobin_Q	-0.0627***	-0.0619***	-0.0634***	-0.0629***	-0.0598***	-0.0595***	-0.0602***	-0.0589***	-0.0633***	-0.0595***
	(0.0152)	(0.0152)	(0.0152)	(0.0152)	(0.0151)	(0.0151)	(0.0151)	(0.0151)	(0.0152)	(0.0151)
log_mktcap	-0.0308	-0.0334*	-0.0307*	-0.0298	-0.0346*	-0.0369**	-0.0350**	-0.0406**	-0.0318*	-0.0387**
	(0.0187)	(0.0187)	(0.0178)	(0.0186)	(0.0180)	(0.0182)	(0.0178)	(0.0172)	(0.0190)	(0.0184)
totDebt_to_assets	-0.2916***	-0.2927***	-0.2880**	-0.2883**	-0.2895**	-0.2931***	-0.2936***	-0.2742**	-0.2866**	-0.2772**
	(0.1124)	(0.1125)	(0.1122)	(0.1125)	(0.1125)	(0.1126)	(0.1124)	(0.1130)	(0.1123)	(0.1132)
BBG_ESG	-0.2147									
	(0.1442)									
BBG_environ		-0.1215							0.158	
		(0.1074)							(0.1645)	
BBG_social			-0.3024**						-0.3608*	
			(0.1294)						(0.1844)	
BBG_govn				-0.4436*					-0.281	
				(0.2692)					(0.3543)	
Sustainalytics_ESG					-0.0974					
					(0.0707)					
Sustainalytics_environ						-0.054				0.0327
						(0.0665)				(0.0852)
Sustainalytics_social							-0.1245*			-0.073
							(0.0698)			(0.0871)
Sustainalytics_govn								-0.1333**		-0.1074
								(0.0657)		(0.0799)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.1068	0.1059	0.1101	0.1073	0.1065	0.1053	0.1067	0.1078	0.1112	0.1085

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 13 – ESG and alpha

This table shows the relationship between ESG scores and a security's alpha, which measures the extent to which a security is undervalued or overvalued. We regress component and composite ESG scores along with common financial characteristics of companies onto a security's alpha. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variable: Alpha										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Tobin_Q	0.1140***	0.1132***	0.1164***	0.1138***	0.1144***	0.1144***	0.1142***	0.1163***	0.1137***	0.1131***
	(0.0122)	(0.0122)	(0.0122)	(0.0122)	(0.0121)	(0.0121)	(0.0121)	(0.0121)	(0.0122)	(0.0121)
log_mktcap	0.0801***	0.0830***	0.0727***	0.0807***	0.0784***	0.0800***	0.0814***	0.0730***	0.0856***	0.0850***
	(0.0150)	(0.0150)	(0.0143)	(0.0150)	(0.0144)	(0.0146)	(0.0143)	(0.0142)	(0.0152)	(0.0148)
totDebt_to_assets	-0.1949**	-0.1933**	-0.2007**	-0.1941**	-0.1960**	-0.1946**	-0.1942**	-0.1961**	-0.1957**	-0.2150**
	(0.0901)	(0.0901)	(0.0900)	(0.0902)	(0.0902)	(0.0902)	(0.0901)	(0.0899)	(0.0898)	(0.0906)
BBG_ESG	-0.0275									
	(0.1156)									
BBG_environ		-0.1772**							-0.2815**	
		(0.0896)							(0.1315)	
BBG_social			0.1638						0.4341***	
			(0.1038)						(0.1474)	
BBG_govn				-0.0747					-0.1252	
				(0.2158)					(0.2832)	
Sustainalytics_ESG					0.0047					
					(0.0566)					
Sustainalytics_environ						-0.0139				-0.0211
						(0.0533)				(0.0682)
Sustainalytics_social							-0.039			-0.0806
							(0.0546)			(0.0697)
Sustainalytics_govn								0.0774		0.1302**
								(0.0593)		(0.0639)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.1911	0.1915	0.1933	0.1912	0.1911	0.1911	0.1915	0.1935	0.211	0.207

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 14 – Principal component analysis and regressions

Panel A presents the principal components (PC1, PC2, and PC3) of the Bloomberg environmental, social, and governance scores along with their loadings and explained variance. Panel B shows the results of regressions examining the relationship of the first principal component of the Bloomberg ESG scores (BBG_PC1) to various institutional investor holdings characteristics and financial performance measures. The dependent variables in each model are various measures of institutional investor holdings and financial performance characteristics — the log number of institutional investors in column 1; the log number of blockholders in column 2; total Big Three ownership in column 3; the mean portfolio allocation of institutional investors in column 4; the mean portfolio allocation of blockholders in column 5; the mean portfolio allocation of the Big Three in column 6; the share ratio in column 7; beta in column 8; and alpha in column 9. The other independent variables are common financial characteristics of companies as control variables. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

Panel A – Principal component loadings – Bloomberg ratings

variables	PC1	PC2	PC3
BBG_environ	0.596	0.119	0.794
BBG_social	0.574	0.628	-0.525
BBG_govn	0.562	-0.769	-0.306
eigenvalue	2.367	0.3908	0.2422
variance explained	78.90%	13.03%	8.07%
cumulative variance explained	78.90%	91.93%	100.00%

Panel B – Regressions with Bloomberg ratings principal component

dependent variables:	log number of institutional investors	log number of blockholders	total Big 3 ownership	mean proportion of total institutional investor portfolio	mean proportion of blockholder portfolio	mean proportion of Big 3 portfolio	Sharpe ratio	Beta	Alpha
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
log_mktcap	0.3824***	-0.0748***	-1.7445***	-0.4135***	-0.0531***	0.0510***	0.1565***	-0.0271	0.0775***
	(0.0082)	(0.0121)	(0.3224)	(0.0427)	(0.0051)	(0.0050)	(0.0333)	(0.0187)	(0.0150)
Tobin_Q	-0.0383**	0.0309***	-0.0207	0.0359**	0.0135***	-0.001	0.1437***	-0.0638***	0.1147***
	(0.0183)	(0.0110)	(0.3425)	(0.0155)	(0.0046)	(0.0011)	(0.0272)	(0.0152)	(0.0122)
totDebt_to_assets	-0.0758	-0.0201	1.9644	-0.0679	0.0433	-0.014	-0.3096	-0.2871**	-0.1965**
	(0.0783)	(0.0724)	(1.9856)	(0.2850)	(0.0305)	(0.0162)	(0.2005)	(0.1124)	(0.0902)
ROA	0.3778**	-0.5166***	0.5593	-0.0495	-0.0564	0.0839**			
	(0.1571)	(0.1992)	(5.8257)	(0.7923)	(0.0839)	(0.0341)			
BBG_PC1	0.0176***	-0.0011	0.8911***	-0.0321	-0.0027	0.0009	0.0524**	-0.0249**	0.0021
	(0.0068)	(0.0083)	(0.2279)	(0.0448)	(0.0035)	(0.0016)	(0.0215)	(0.0126)	(0.0101)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.8361	0.1377	0.1804	0.3491	0.2031	0.6587	0.2321	0.1085	0.2028

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Panel C presents the principal components (PC1, PC2, and PC3) of the Sustainalytics environmental, social, and governance scores along with their loadings and explained variance. Panel D shows the results of regressions examining the relationship of the first principal component of the Sustainalytics ESG scores (Sustainalytics_PC1) to various institutional investor holdings characteristics and financial performance measures. The dependent variables in each model are various measures of institutional investor holdings and financial performance characteristics — the log number of institutional investors in column 1; the log number of blockholders in column 2; total Big Three ownership in column 3; the mean portfolio allocation of institutional investors in column 4; the mean portfolio allocation of blockholders in column 5; the mean portfolio allocation of the Big Three in column 6; the share ratio in column 7; beta in column 8; and alpha in column 9. The other independent variables are common financial characteristics of companies as control variables. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

Panel C – Principal component loadings – Sustainalytics ratings

variables	PC1	PC2	PC3
Sustainalytics_environ	0.603	0.367	0.708
Sustainalytics_social	0.603	0.371	-0.706
Sustainalytics_govn	0.522	-0.853	-0.003
eigenvalue	2.0019	0.625	0.3731
variance explained	66.73%	20.83%	12.44%
cumulative variance explained	66.73%	87.56%	100.00%

Panel D – Regressions with Sustainalytics ratings principal component

dependent variables:	log number of institutional investors	log number of blockholders	total Big 3 ownership	mean proportion of total institutional investor portfolio	mean proportion of blockholder portfolio	mean proportion of Big 3 portfolio	Sharpe ratio	Beta	Alpha
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
log_mktcap	0.3856***	-0.0742***	-1.4363***	-0.4139***	-0.0536***	0.0509***	0.1678***	-0.0339*	0.0781***
	(0.0103)	(0.0115)	(0.3066)	(0.0359)	(0.0049)	(0.0022)	(0.0318)	(0.0178)	(0.0143)
Tobin_Q	-0.0432***	0.0311***	-0.1968	0.0478	0.0139***	-0.0014	0.1406***	-0.0595**	0.1144***
	(0.0117)	(0.0109)	(0.3474)	(0.0351)	(0.0046)	(0.0025)	(0.0270)	(0.0242)	(0.0121)
totDebt_to_assets	-0.0837	-0.0183	1.7773	-0.0455	0.0441	-0.0148	-0.3013	-0.2837	-0.1968**
	(0.0677)	(0.0726)	(2.0091)	(0.2240)	(0.0306)	(0.0146)	(0.2010)	(0.3247)	(0.0903)
ROA	0.3783*	-0.5125**	0.0964	-0.0689	-0.0535	0.0849**			
	(0.1982)	(0.1995)	(5.8848)	(0.6433)	(0.0840)	(0.0429)			
Sustainalytics_PC1	0.0237***	-0.0035	0.6954***	-0.0626*	-0.0029	0.0022	0.0378*	-0.0213*	0.0018
	(0.0083)	(0.0085)	(0.2469)	(0.0329)	(0.0036)	(0.0018)	(0.0221)	(0.0111)	(0.0104)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.8376	0.1378	0.163	0.3549	0.2032	0.6599	0.2315	0.1073	0.2028

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 15 – GHG emissions and holdings data

This table shows the relationship of a company's greenhouse gas (GHG) emissions to various institutional investor holdings characteristics and financial performance measures. The dependent variables in each model are various measures of institutional investor holdings and financial performance characteristics— the log number of institutional investors in column 1; the log number of blockholders in column 2; total Big Three ownership in column 3; the mean portfolio allocation of institutional investors in column 4; the mean portfolio allocation of blockholders in column 5; the mean portfolio allocation of the Big Three in column 6; the share ratio in column 7; beta in column 8; and alpha in column 9. The independent variables are the natural log of GHG emissions along with common financial characteristics of companies as control variables. Dummy variables are used to control for year and industry effects. Standard errors are clustered at the industry level. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients. Definitions of all variables along with relevant calculations appear in Table 1.

dependent variables:	log number of institutional investors	log number of blockholders	total Big 3 ownership	mean proportion of total institutional investor portfolio	mean proportion of blockholder portfolio	mean proportion of Big 3 portfolio	Sharpe ratio	Beta	Alpha
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
log_mktcap	0.3711***	-0.0686***	-2.0594***	-0.4374***	-0.0547***	0.0553***	0.0678	-0.0192	-0.0192
	(0.0145)	(0.0155)	(0.4084)	(0.0493)	(0.0054)	(0.0034)	(0.0425)	(0.0220)	(0.0220)
Tobin_Q	-0.0285*	0.0356**	0.4598	0.0261	0.0084	-0.0034	0.1772***	-0.0406**	-0.0406**
	(0.0151)	(0.0150)	(0.4264)	(0.0515)	(0.0051)	(0.0036)	(0.0370)	(0.0191)	(0.0191)
totDebt_to_assets	0.0441	-0.2214**	-1.244	-0.1643	0.0476	-0.0285	-0.5411**	-0.4646***	-0.4646***
	(0.0884)	(0.0958)	(2.4977)	(0.3014)	(0.0329)	(0.0210)	(0.2691)	(0.1390)	(0.1390)
ROA	0.4653*	-0.5592**	1.5565	0.625	-0.1164	0.1397**			
	(0.2501)	(0.2705)	(7.0686)	(0.8530)	(0.0947)	(0.0595)			
log_GHG_emissions	0.0058	-0.0009	0.5641**	0.0293	0.0003	-0.0012	0.0698**	0.0119	0.0119
	(0.0095)	(0.0105)	(0.2691)	(0.0325)	(0.0036)	(0.0023)	(0.0284)	(0.0147)	(0.0147)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	2876	2876	2876	2876	2876	2876	2876	2876	2876
R-squared	0.828	0.1862	0.187	0.3924	0.3108	0.6466	0.256	0.1632	0.1908

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

4 Institutional Investors, Alternative Asset Managers, and ESG Preferences

Abstract

We survey institutional investors to understand why they integrate environmental, social and governance (ESG) factors into their investment management processes. Using a unique data set, we find that limited partners (LPs) are motivated to incorporate ESG because they believe that ESG usage is more strongly correlated with financial performance. We find that general partners (GPs) are motivated to integrate ESG factors into their investment strategies in response to increased client demand for sustainable products. Furthermore, we find that private equity (PE) uses ESG factors more intensely than venture capital (VC) regardless of geography. We also find that PE firms use voice and exit strategies more extensively than VC funds in efforts to promote ESG activities in companies. When evaluating individual components of ESG scores, we find that the investors consider the governance score the most important component, followed by E, and then S.

4.1 Introduction

The last decade has seen a rapid increase in the integration of environmental, social and governance (ESG) factors into the investment decisions of institutional investors. Data from Natxis Investment Managers indicate that the percentage of institutional investors that choose to integrate ESG factors into investment decisions increased by 18% between 2019 and 2021 (Natxis, 2021). Despite the strong growth in ESG integration across investor types, however, many institutional investors still choose to integrate just one or two of the factors or have yet to consider ESG factors at all in their asset allocation process (OECD, 2020). Moreover, while articles in this literature have focused on the ESG fund segment generally (see for example Amel-Zadeh and Serafeim, 2017; Hanson et al., 2017; Gibson et al., 2021; Eccles et al., 2011; Krueger et al., 2019; Bolton et al., 2022; Sautner et al., 2022), relatively little is known about ESG integration in private markets. And while much literature considers the implications of climate risk for investors (Krueger et al., 2019; Bolton et al., 2022; Sautner et al., 2022; Goldstein et al., 2022) comparison between E, S, and G considerations for investors remain under-explored.[17] There are relatively few empirical studies examining ESG considerations for limited partners (LPs) and general partners (GPs).

[17] Chapter 3 of this thesis considers these relative preferences for institutional investors in publicly traded securities.

There is a large literature on the effect of ESG integration into investment strategies.[18] We are motivated by three stands of the literature that reach different hypotheses on the integration of ESG factors. The first strand argues that that most institutional investors take ESG factors into account because they believe them to be linked to financial performance (Amel-Zadeh and Serafeim, 2017). The second strand argues that the link between ESG and firms' financial performance is the combined effect of a sufficiently large number of investors acting on nonfinancial motives to slant their portfolios towards firms with strong ESG criteria and away from firms with poorer ESG quality. In these models, the subset of investors acting this way needs to be just large enough to raise the cost of capital for firms with poor ESG quality in order to provide a financial incentive to invest in improving its ESG quality and, thus, to attract a larger number of investors (Heinkel et al., 2001). The third stand argues that the positive relationship between ESG and financial performance involves considering the risk benefits that may accrue to individual firms due to their ESG characteristics, as well as the diversification benefits related to firms' ESG characteristics (Statman and Glushkov, 2009). In these studies, the improved financial performance depends on how the portfolio manager uses ESG screenings (Barnett and Salomon, 2006; Sherwood and Pollard, 2018; Hanson et al., 2017).

In order to shed light on these questions, we study the effect of institutional investors' perceived importance of ESG factors for their investments in private equity (PE) and venture capital (VC), as well as the factors that influence alternative asset managers to incorporate ESG factors into their portfolio allocations. In order to empirically study these questions, we introduced a new dataset from a 2020 survey of institutional investors. The survey data comprise information from 106 UK, European and North American institutions, as well as for a small percentage of respondents around the world, who are currently investing in private equity and venture capital. In the survey, we asked investors about their motivations for considering ESG factors, the relative importance of ESG criteria, their use in relation to risk and return considerations, how often ESG criteria are considered and in which stages of the portfolio management process, and for which screening or evaluative purposes ESG criteria are employed.

[18] For a general overview of themes in the ESG related literature, see Gillan et al. (2021).

To assess the barriers to and motives for ESG integration, we first present basic statistics showing the reasons that these investors consider integrating ESG into their investment process. We find that, on average, 48% of institutional investors on average rate investment riskiness as their first or second important reason for considering ESG, compared to only 13% for diversification purposes. Meanwhile, 45% respond that they rate an ESG mandate as first or second. This is consistent with evidence that institutional investors increase inflow of funds by signing onto the UN PRI even if they underperform financially (Gibson et al., 2020). We also evaluate investor views on the barriers to ESG usage in the investment asset management process. The results here indicate that the absence of accurate data and the weak comparability of data are the most important hurdles to the implementation of ESG criteria.

We asked LPs and GPs to rate the motivations that would influence them to adopt ESG factors in their investment decision processes. Although GPs recognize the correlations with financial performance, they are more motivated to respond to clients' demands (i.e., demand from LPs). Not surprisingly, we find that LPs are more motivated by the belief that there are correlations with investment risk generally.

We distinguish between PE and VC investment funds in order to proxy for the average age of portfolio companies and the added risk and uncertainty that accompanies investments in earlier stage companies. We find that PE firms use ESG factors more intensely than do VC funds regardless of geography. Moreover, we find that PE firms use voice and exit strategies more extensively than VC funds in an effort to promote ESG activities in companies. Considering that VC funds are generally investing in early-stage and newer companies while PEs are engaged in enhancing value in more established companies, our results are consistent with findings that investors with longer-term horizons engage more with the ESG quality of companies in their portfolios (Starks et al., 2020).

Next, we study the complementary use of voice and exit strategies by PE and VC firms to manage their ESG issues with companies. We document that GPs use exit and voice more often than LPs. While our interview evidence confirms that LPs will address ESG concerns about a particular company with a GP, this is only for egregious concerns. Our findings highlight, among other things, that LPs do not have the same significant effect on governance that GPs have.

We also study investors' views on the relative importance of the E, S and G scores individually. It is well known that institutional investors are increasingly implementing ESG scores into their portfolio management activities (Barko et al., 2021; Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011; Hanson et al., 2017; Dyck et al., 2019). Surprisingly, this relation has not been explored in the literature until recently. We find that investors, when evaluating individual components of ESG scores, consider the governance score the most important component, followed by E, and then S. Our findings generally support the theoretical argument that ESG, particularly the governance dimension, is related to decreased risk.

The paper proceeds as follows. Section 2 reviews the related literature. Section 3 describes the methodology. Section 4 examines the summary statistics. Section 5 presents the results. Section 6 concludes.

4.2 Motivation and Literature Review

This section provides an overview of the existing theoretical and empirical literature, as well as the motivation for this research and the hypothesis development.

The ESG preferences of investors depend very much on the style and strategy investors of investors when integrating ESG. Strategies can vary from avoiding 'sin stocks'[19] to more active ways of involving ESG risk management into the investment decision process. They can also encompass a focus on broader measures of corporate social responsibility (CSR) or be more actively pursued strategies of sustainability (sustainable equity, credits, multi-asset or infrastructure debt) and/or impact (green bonds, impact equity, emerging market loans).[20] The studies to date have not differentiated their findings with regard to the strategy that investors deploy. There is also not a common definition of what the different strategies exactly entail. That is, at least in part, the evidence explaining the impact of ESG factors—for example, on financial performance—is mixed at best. Thus, we try to differentiate among the effects of the different styles, but also consider other aspects of ESG relevant to investors and

[19] The term 'sin stocks' commonly refers to a publicly traded company that is either involved in or associated with an activity that is considered unethical or immoral such as the production of alcohol, tobacco or weapons.
[20] One way to classify different investment styles while at the same time explaining how an investor is making use thereof is shown by NN Investment Partners (2019) in their Responsible Investing Report 2019.

firms; we then turn to the literature on ESG data and disclosure and finally explore the literature concerning investors' voting and other engagement strategies concerning ESG, which are relevant after the investment decision has been made.

A large literature on ESG investing has emerged in recent years. Two meta studies provide a useful overview on this literature up until 2015. Both studies find a remarkable correlation between ESG and economic performance. One study (Clark et al., 2015) explores the business case for ESG[21] by looking into the relationship between ESG and cost of capital and operational performance, as well as stock price effects of ESG, and the results of active ownership. The study reviews and categorizes more than 200 academic papers, industry reports, newspaper articles and books and concludes that 90% of the studies on the cost of capital show that sound ESG standards lower companies' cost of capital. Further, 88% of the research shows that solid ESG practices result in firms' better operational performance, and, finally, 80% of the studies show that companies' stock price performance is positively influenced by good ESG practices (Clark et al., 2015).

The other meta study focuses exclusively on the effect of ESG on financial performance but captures even more academic resources (Friede et al., 2015). It extracts all of the primary and secondary data from previous academic studies, thereby combining the findings of 2200 individual studies. This research shows that roughly 90% of the studies find a non-negative relation between ESG and corporate financial performance. The effect of ESG on financial performance is still the core question, often presented in terms of whether a trade-off exists for investors between the financial and non-financial dimensions of the investment (see for example Bialkowski and Starks, 2016).

4.2.1 ESG and its Impact on Investment Performance

In the following, we aim to distinguish between active and passive strategies of integrating ESG to see what impact they may have on firms' financial performance, as well as on investors' performance. This distinction is more commonly accepted: passive strategies focus

[21] This study uses the term 'sustainability' as an equivalent for ESG. In general, terms such as "sustainability", "environmental, social and governance (ESG)", and also "corporate social responsibility" (CSR) have been used interchangeably in the past, although they can mean different things. On the lack of a definition of sustainability, see Gray (2010).

on negative screening of certain industries, whereas active strategies are all other strategies that include some form of positive screening of ESG. Differentiating among those active strategies is more difficult. We make a distinction in the following between strategies that focus on ESG as an element of investment risk analysis versus those whereby the investor decides to focus more on an ESG-related opportunity or market segment, as with so-called sustainability or impact strategies (e.g., alternative energy as the main focus of a fund would fall under this category.)

Originally, the effects of ESG were examined only for negative screening strategies, commonly referred to as 'avoiding sin stocks'. Examples for such studies are manifold (see for example Hong and Kacperczyk, 2009; Statman and Glushkov, 2009; or, more recently, Bansal et al., 2018; Trinks and Scholtens, 2017). This type of negative screening, however, is now considered the most detrimental to financial performance and, nowadays, full integration of ESG into stock valuation, active ownership, and positive screening is considered much more beneficial (Amel-Zadeh and Serafeim, 2017).

In this regard, a strand of literature examines financial performance of sustainable investment portfolios and generally fails to find any performance differences between SRI funds and conventional mutual funds (Riedl and Smeets, 2017; Geczy et al., 2005),[22] which can be due to difference in investment styles (Amel-Zadeh and Serafeim, 2017). It is questionable whether an investment in an SRI fund reflects a stable ESG profile over time and, indeed, offers higher exposure to ESG values than conventional funds do (Bialkowski and Starks, 2016).

4.2.2 Financial Performance with Active ESG Strategies—Tackling Investment Risk

The more active consideration of ESG factors often starts with the understanding that such factors can be negatively related to extreme downside risk. Shafer and Szado (2019) have shown that better ESG practices, as well as better practices in the individual E, S, and G pillar, significantly reduce *ex ante* expectations of a left-tail event.[23] Hamilton (1995) shows a significant negative impact of the announcements of the release of information about the use

[22] An outperformance of SRI funds is found by Borgers et al. (2015).
[23] See also, Barnett and Salomon (2022).

of toxic chemicals on stock prices in the US, with similar effects being observed for other countries in Latin America and Asia (Dasgupta et al., 2001). In a similar vein, Hoepner et al. (2019) highlight that ESG issues can benefit shareholders by reducing firms' downside risk.

There is general agreement among investors that successful ESG investing depends on integrating ESG factors with the methods and data of traditional "fundamental" financial statement analysis (Hanson et al., 2017). ESG concerns tend to show up as risk factors that can translate into higher costs of capital and lower values. Many fundamental investors view companies' effectiveness in managing such factors as an indicator of management "quality". Fixed-income investors are equally concerned as equity investors about ESG exposures, eventually generating "tail risks" that can materialize in both going-concern and default scenarios (Hanson et al., 2017). According to the view above, ESG integration is not different from any other analysis, it's simply a matter of integrating all relevant information (Hanson et al., 2017). Others, however, argue that ESG information presents itself as an extra level of intelligence that can also provide insight into future performance next to fundamental information, which relies heavily on a company's financial statements and technical information, and can be derived from a company's past performance in the stock market (Verheyden et al., 2016).

Building on the growing investment practice of considering ESG as risk factors in financial analysis, ESG can also be used to diversify risks in portfolio construction. Sherwood and Pollard show that integrating ESG emerging market equities into institutional portfolios could provide institutional investors the opportunity for higher returns and lower downside risk than non-ESG equity investments (Sherwood and Pollard, 2018). This link has been also acknowledged in key studies which found that, in the US, ESG information offers an alpha advantage in equities portfolios across all regions (UN PRI, 2018).

4.2.3 Financial Performance under Sustainability and Impact Strategies

In contrast to the literature on ESG risk management, studies on the impact of ESG on financial performance with opportunity-driven sustainability and impact strategies are scant. With such strategies, ESG is not only considered as a risk factor, but it also plays a role in the

active selection or screening of investment opportunities. Strategies focusing on the UN Sustainable Development goals represent a new trend in this area (UN, 2022).

A large part of the existing literature that considers the ESG impact of these even more active strategies reviews the performance of green bonds (Tang and Zhang, 2018), which are only one aspect of an impact-related strategy. Most empirical studies report that the investment returns of green bonds are not superior (Karpf and Mandel, 2018; Baker et al., 2018; Factica et al., 2021).[24] Martin and Moser (2016) conducted an experiment in which they found that managers' green investments have no impact on future cash flows in their experimental markets, but that investors respond favorably when managers make and disclose an investment and highlight the societal benefits rather than the cost to the company. Moreover, Renneboog et al. (2008)'s results suggest that a subset of investors are willing to accept lower financial performance to invest in funds that meet social objectives.

Beyond the impact of ESG on financial performance and the unclear results of impact- and sustainability-related strategies, investors may have other motivations of investors to consider ESG (more thoroughly), which we now explore.

4.2.4 Other Motivations for ESG Consideration by Investors

Investors, in general, may be motivated for three reasons: performance motives (investment performance); financial motives (product strategy or client demand); or ethical considerations (Amel-Zadeh and Serafeim, 2017). Originally, the last element was the core motivation and defined an investment stride independent of ESG, usually referred to as ethical investing. Over the last five to ten years, financial performance seemed to be the main driver, but as we have shown, results—except for the category of considering ESG as an investment risk—are mixed. Even with such results, client demand for investors will become more important over time and will convince even more investors (Hainmueller et al., 2015). Such demand may also be further reinforced by regulatory measures (Zerbib, 2019).

[24] On the broader category of impact funds, see Barber et al. (2021).

4.2.5 Firm Returns from ESG Investments

What has been shown as investors' main motivation is also relevant for firms and their quest to integrate ESG into their managerial practices. Firms can be motivated by financial performance but also by the demand of investors, which in the case of firms would ultimately translate into lower costs of capital. With regards to the first aspect, financial performance, there are a number of studies look at the environmental management of the firm and associated higher returns (Konar and Cohen, 2001; Klassen and McLaughlin, 1996), as well as at the cost benefit of higher environmental standards (Dowell et al., 2000). Most of these studies come to the conclusion that enhanced environmental practices or standards lead to higher financial performance (see also Derwall et al., 2005). Brammer et al (2006) offer a more critical view with regard to a company's social performance and its impact on the financial performance of the firm. Regarding corporate governance, most of the available literature examines (in the most studies positive) the correlation between firm-level corporate governance practices and different measures of firm performance (see for example Love, 2011).

Aside from the direct benefit of investing in ESG, firms can also be motivated by the preferences of investors rather than by the actual positive effect of ESG on their bottom line. If enough investors trigger a firm to present itself as not only profit-driven, that firm gains a competitive advantage in attracting investors, which in turn will lower its cost of capital. The existing literature often explains ESG investments as being driven by a subset of investors that have a non-financial component of utility (Fama and French, 2007). In order to provide firm with a positive incentive to invest in ESG, this subset of investors just needs to be just large enough to raise the cost of capital for firms that do not invest in ESG (Heinkel et al., 2001). Likewise also negative ratings also may ultimately influence firms to do more. It has been shown that firms that initially receive poor environmental ratings, improve their environmental performance more than other firms (Chatterji and Toffel, 2010). Finally, McWilliams and Siegel (2001) show how companies can offer the ideal level of ESG measures that maximizes profit, while at the same time satisfying stakeholder demand for ESG.[25]

[25] The authors use the term 'CSR' though.

4.2.6 ESG Data and Disclosure

As we have showed above, most of the literature finds it rewarding for firms to implement sustainable management strategies either because such strategies do, indeed, improve some measure of financial performance or because they lower the costs of capital due to strong investor demand for enhanced ESG practices. To successfully implement such strategies, companies are required first to identify the specific sustainability issues that are material to them. Unfortunately, the materiality of ESG issues differs substantially among industries. Mining has a different exposure to ESG than real estate has, for example (Clark et al., 2015). The materiality of the different ESG issues likely varies systematically across firms and industries (Eccles et al., 2011). Firms nowadays release a wealth of information in the form of ESG data, but the number of ESG- related issues that attract investment raises the question of which of these ESG data are more or less material (Khan et al., 2016).

Given the above, it is not surprising that the literature has identified several issues around ESG data. Such work implies that the ESG data universe is getting too complex and confusing. Several studies show that there is very little agreement among rating agencies and data vendors on how to construct and use ESG measures (Eccles and Stroehle, 2020; Chatterji et al., 2016). Similarly, such differences were shown earlier, for governance-related data (Daines et al., 2010) and environmental data (Delmas et al., 2013). In more recent works, Gibson et al. (2021) and Brandon et al. (2021) provide evidence on the impact of ESG rating disagreement on stock returns.

Starting with Eccles and Stroehle (2020), a number of papers have explored the root causes for data differences by looking at the different dimensions used for the definitions of sustainability and materiality, but also at the specific service offerings and methodologies used by data vendors. In light of the existing variety and inconsistency, Kotsantonis and Serafeim (2019) suggest that companies should take control of the ESG data narrative, accept a baseline of ESG metrics, and self-regulate in ways that aim to provide comparability. ESG disclosure driven by reporting standards of organizations such as the Sustainability Accounting Standards Board (SASB) also plays an instrumental role in defining a such a baseline (Kotsantonis and Serafeim, 2019).

In general, market interest in the level of a company's degree of transparency about its ESG performance and policies has grown continuously since the last decade (Eccles et al., 2011). Voluntary disclosure on ESG already showed lower costs of capital for those firms with superior standards, which works as an incentive for some firms (Dhaliwal et al., 2011). A number of papers use a cross-country analysis and provide evidence of a strong relationship between the extent and the quality of a firm's ESG disclosure.[26] Also on the more specific disclosure of carbon emissions it has been shown that markets penalize all firms for their carbon emissions, but an additional penalty is imposed on firms that do not disclose emission information at all (Matsumura et al., 2013).

Regulatory measures, such as the passage of European Union (EU) Directive 2014/95 on disclosure of non-financial information has likewise motivated companies to provide more (and better) ESG information, as lead investors continued placing higher weight on ESG information in decision making (Grewal et al., 2019). With Sustainability-Related Disclosures (EU Regulation 2019/2088), the EU requires alternative investment fund managers to, among other things, consider and document the relevance of ESG to their investment policies and produce required disclosures in this regard. In addition, when preparing or updating their staff remuneration policies (including, where required, public or investor disclosures about their remuneration practices), managers are required to specify how these policies are consistent with the integration of sustainability risks (Maleva-Otto and Wright, 2020).

4.2.7 ESG and Investor Behavior

Beyond the question of how different investors integrate ESG criteria and information in their investment decisions, ESG also plays a role during the holding period of an investment. As part of their portfolio-related work as equity investors (public or private), investors may be asked to vote on ESG-related matters or to engage informally to mandate sustainability-related change. The latter is also relevant for debt investors or passive funds. In the following, we first look at the literature on voting and then consider the literature focusing on other forms of investor engagement.

[26] See chapter 2 of this thesis.

4.2.7.1 Voting on ESG matters

Overall, the growth of ESG investing has contributed to a stronger focus on ESG in corporate elections. ESG-specific shareholder resolutions focus on topics such as climate change, data protection, diversity, human rights, etc. Across all fund families, asset-manager proxy voting support for ESG-related shareholder resolutions has increased considerably over the past five years, with average support across 50 large fund families rising to 46% from only 27% in 2015 (Cook, 2020). Funds offered by Allianz Global Investors, Blackstone, Eaton Vance, and PIMCO were the most likely to support shareholder-proposed ESG resolutions in 2019, voting for these resolutions more than 87% of the time (Cook and Hale, 2020).

After BlackRock's announcement in January 2020 that it would elevate climate-related and social investment risk to its priorities (Fink, 2020), researchers examined the proxy statements of poultry processing company Sanderson Farms in Mississippi and how BlackRock, holding 10% of the company's stock, would react to the Company's Board rejecting the proposal that Sanderson Farms publicly report on climate-related water risks according to SASB standards (Rissman, 2020).

Others explored the voting record of BlackRock and Norway Fund to assess whether institutional investors engage with companies on corporate externalities such as greenhouse gas emissions. Brière et al. (2018) found that, in general, universal ownership as well as delegated philanthropy appear to provide incentives for institutional investors to combat negative externalities generated by firms.

Institutional investors with higher sustainability footprints also tend to have longer investment horizons independent of whether the horizon is measured by investors' legal types or by their trading frequency; high sustainability-footprint investors also display higher risk-adjusted performance (Gibson and Krüger, 2017).

With regard to index funds however, Griffin (2020a, 2020b) shows that the three passive investment power houses, Vanguard, BlackRock and State Street, while being in a new and pivotal role as the framers of market-wide governance standards, show little support for E&S proposals, despite a considerable marketing focus.

4.2.7.2 Engagement

Apart from voting, investors also engage in other forms of ESG interventions with their firms. Concerning corporate governance, McCahery et al. (2016) have documented wide-spread behind-the-scenes intervention, as well as governance-motivated exits. Investors face several impediments to engagement, however, principally because of liquidity concerns, free rider problems, and legal concerns. Long-term investors intervene more intensively than short-term investors, showing concerns about a firm's corporate governance or strategy rather than about short-term issues (McCahery et al., 2016). Barko et al. (2021) show that activism is more likely to succeed when targets have a good *ex ante* ESG track record, lower ownership concentration and growth (see also Broccardo et al., 2022).

Stewardship codes are another approach designed to increase the consideration of ESG criteria by institutional investors; there is some evidence that this can drive improved ESG quality.[27] Dyck et al. (2019) look specifically at institutional investors and overall conclude that they drive the ESG agenda since their ownership is associated with higher firm-level E&S scores. The revised UK stewardship (UK FRC, 2019) now makes explicit reference to ESG factors and signatories are expected to take into account material ESG factors, including climate change, when fulfilling their stewardship responsibilities. The Code is written for asset owners, asset managers and entities providing services to the institutional investment community, including investment consultants, proxy advisers and other service providers that want to demonstrate their commitment to stewardship.

4.3 Methodology

This section first describes our survey construction and methodology. We then discuss the survey delivery method, the response rate and the characteristics of the respondents. We also describe the research design in which semi-structured interviews were used to collect qualitative data.

[27] See Chapter 2 of this thesis

4.3.1 Survey Development and Delivery

We designed our survey to elicit responses from institutional investors and alternative asset managers on how and why they integrate ESG factors into their investment evaluation and decision-making processes. The questions concern who is responsible for considering ESG factors; how often ESG criteria are considered and in which stages of the investment decision making and management process, and for which screening or evaluative purposes ESG criteria are employed. We also asked respondents about their motivations for using ESG criteria and how they use ESG in relation to risk and return considerations. We also asked questions to ascertain the relative importance of the environmental, social, and governance components of ESG criteria. Since we are interested in how different categories of asset managers utilize ESG criteria, we have a final section requesting general and demographic information to classify our survey respondents according to investment strategy and to target asset classes, type of institutional investor, geographic location, and size of assets under management. To encourage higher response rates, we did not ask participants to identify themselves beyond these aggregate demographic statistics. We further emphasized that the individual responses would be treated as confidential.

Our questions were developed upon review of previous academic literature that conducted surveys of institutional investors concerning corporate governance and ESG-related topics (McCahery et al., 2016; Amel-Zadeh and Serafeim, 2018). We also based our survey on similar surveys conducted by industry groups and consultancies (Bfinance 2017; State Street Global Advisors, 2017; MSCI, 2018; FTSE Russell, 2018; BNP Paribas, 2019; Morrow Sodali, 2020).

While previous research has focused on ascertaining the ESG-related preferences of institutional investors, our focus is on specific types of institutional investors, such as LPs and GPs, and their preferences for ESG investing. Additionally, we look beyond the performance considerations surrounding the use of ESG data to focus on the particular risks that these fund managers attempt to manage and mitigate by considering ESG criteria. We also look at the relative role of voice and exit with regard to ESG, further extending the work of McCahery et al. (2016) and Broccardo et al. (2022) to consider how investors use voice and exit in connection with ESG concerns. Furthermore, our survey was designed to unpack

the individual environmental, social, and governance components of ESG data to determine the relative importance of these factors for this category of investors.[28]

We drafted our survey questions in consultation with academics in finance and law as well as with academic experts in survey design. We then further refined our questions after an initial round of feedback and discussions with alternative asset managers and institutional investors.

We used a combination of electronic delivery, with a link to an online survey platform, and a paper version of the survey. The online version of the survey allowed for random ordering of response choices and sub-sections of questions. The survey was distributed via an email link to a list of the authors' personal contacts working in the asset management industry, as well as via a database of asset managers and institutional investors compiled by a research assistant and supplemented with contacts from our own industry contacts. We also distributed a paper version of the survey to distribute to the practitioner attendees at several conferences and industry events. We guaranteed anonymity in order to ensure honest responses; however, this means we are unable to map the responses to investor or fund performance metrics. A copy of the survey questions appears in the appendix.

From a distribution to approximately 2,200 individuals, we received 106 responses. This overall response rate of 4.8% is similar to the response rates achieved in academic studies in finance (Brav et al., 2008; Dichev et al., 2013).

4.3.2 Semi-structured interviews

To confirm, explain, and otherwise contextualize some of the findings of our survey results and analysis, we conducted ten semi-structured interviews with a range of institutional investors: a US-based PE fund manager; a UK-based hedge fund manager; a portfolio manager for a multinational insurance company headquartered in continental Europe; a PE fund manager based in continental Europe; a New Zealand-based PE fund manager; three investment officers at a pension fund managers based in continental Europe; an investment officer at an asset manager for pension funds and other managed accounts based in continental Europe; and an investment manager for a continental-European development

[28] See Chapter 3 of this thesis.

bank. While the agenda and set questions for the interviews were based on our survey questions, we allowed the interview to develop according to the interviewees' particular perspectives. We also wished to clarify the context of the particular results of our analyses of the survey data. The semi-structured interview instrument appears in the appendix.

4.3.3 Methods

In our analysis of the survey results, we consider firm characteristics as control variables, but we also focus on the geographical usage of ESG. While the majority of our analysis focuses on continental Europe, the UK and the US, we also use data from a number of countries outside of North America and Europe. The data allow us to consider investor type, broadly characterized as GPs and LPs. We classify GPs as investors who identified as a PE fund, VC fund, or hedge fund. All other investor types are classified as LPs since they are primarily LPs in alternative investment managers and funds. To characterize LPs' commitment to ESG, we view them as driving the implementation of ESG factors (which they also see as more strongly correlated with financial performance). While GPs do recognize the correlations with financial performance, they are much more motivated by client demand (i.e. demand from LPs). LPs are more likely to be motivated by the correlations with investment risk generally. However, when we ask specifically about the investors' reputational risk (*vis-à-vis* stakeholders), GPs are more likely to consider ESG data. The distinction between PE and VC can be used to analyze important risk differences between start-up/earlier stage investments in newer companies and industries and investments in more established companies.

We calculate mean responses to each answer and then use t-tests to compare motivations and barriers to each other, as well as results between categories of respondents (i.e. PEs and VCs). We create index variables by encoding and summing up responses based on how often investors use ESG for various purposes. This then enables us to perform ordered logit regressions that allow us to examine correlations among many variables simultaneously. We utilize this method to test the statistical significance, magnitude, and direction of relationships, while employing control variables and examining cross relationships among variables.

4.4 Summary Statistics

Table 1 provides an overview of the characteristics of the survey respondents. Our respondents represent a cross section of investors with a tilt towards alternative asset managers. The largest group of respondents work as asset managers for PE funds (39%), followed by pension funds (19%), and VC funds (17%). The remaining comprise asset managers for pension funds, endowments, and other managed accounts (13%), hedge funds (6%), and insurance companies (6%). Seventeen percent of the respondents in our sample work for those institutions with less than $1 billion in assets under management; 41% with assets between $1 billion and $20 billion; 24% with assets between $20 billion and $50 billion; and 18% with assets exceeding $50 billion. The respondents are concentrated in North America (29%), continental Europe (32%), and the UK (12%), and Asia (10%), with a small percentage of respondents are from South America (5%), the Middle East and Africa (6%), and Australia and New Zealand (6%). We asked respondents to report whether they have an ESG mandate--59% of reporting having such a mandate.

We examine the main motives for and barriers to incorporating ESG factors into the asset-allocation processes of institutional investors. To capture these motives and barriers, we asked investors to rank their top four reasons for incorporating ESG factors into their investment process. Table 2 presents some summary statistics for the sample split according to respondents' mean rankings of motivations and barriers to ESG usage by institutional investors. Panel A of Table 2 shows the percentage of respondents ranking the top one or two motivations for ESG usage. As Column 2 illustrates, 48% of institutional investors on average rank ESG factors related to investment riskiness, as either their first or second reason for considering ESG, compared to only 13% for diversification purposes. Other important motivations for incorporating ESG factors include an explicit investment mandate, client demand and ESG data positively correlate with investment returns. Overall, the results presented in Table 2 are consistent with the proposition that ESG usage is associated with decreased risk (Becchetti et al., 2015; Shafer and Szado, 2020; Albuquerque et al., 2020).

Our findings so far suggest that many institutional investors focus on ESG factors to evaluate financial risks when considering an investment decision and its future financial performance. To understand the challenges to ESG usage, we asked the respondents to rank the top four barriers to ESG usage, based on a five-point response scale (from "very important" to "not

important at all"). Column 3 of Panel B reports that the respondents rank the barriers to ESG usage between 2.48 to 4.37. The evidence in Panel B suggests the important role that data providers and regulators, respectively, could play an important role in providing quality data and standardized metrics. Our findings are consistent with Amel-Zadeh and Serafeim (2018), and Christensen et al. (2021), who claim that investors view the absences of comparable data as a major hurdle for examining firms' ESG factors.

In Table 3, we assess the importance of ESG integration for other institutional investors, broadly characterized as GPs and LPs. The evidence suggests that investor characteristics may help explain whether some institutional investors are more likely to include ESG factors in their investment management processes (Kruger et al., 2019). Prior research documents the positive association of LPs with ESG usage and improved ESG performance (Dyck et al., 2019). In line with this, in Table 3 Panel A, we also find evidence that while GPs recognize the correlations with financial performance, they are much more motivated by client demand (i.e. demand from LPs). In contrast, LPs are more likely to be motivated by the correlations with investment risk generally. However, we asked specifically about the investors reputational risk (vis-à-vis stakeholders), and the results suggest that GPs are more likely to consider ESG data in this respect.

While GPs and LPs do, on average, appear to see some links between ESG and financial performance, these links are more pronounced for LPs. GPs, on the other hand, rank client demand or client mandates as a higher motivation. So, while investors and stakeholders in pension funds, insurance companies, and other asset managers (i.e. sovereign wealth funds, endowments, etc.) also demand ESG considerations with respect to alternative asset classes, GP alternative asset managers are much more driven by client demand and less so by potential linkages to risk and returns. For example, at the extreme, one London-based hedge fund manager indicated that the addition of ESG considerations in their investment process is mostly a data-collection exercise to appeal to investor demand. In very few cases do ESG factors influence the actual investment decision or portfolio mix; however, LPs want the information. According to the hedge fund manager, this is not because they do not care about ESG; rather they simply rarely experience a situation in which there is sufficient ESG evidence alone to warrant a change in an investment decision based on traditional financial (i.e. non-ESG) metrics. At the same time, this sentiment is not necessarily inconsistent with the supposition that ESG metrics are correlated with financial performance.

Consistent with extant findings on barriers to ESG usage in PE, Table 3, Panel B shows that LPs also have difficulties incorporating ESG policies due to the lack of accurate and reliable data (2.37) and clear guidelines (2.77) required to facilitate predictable benchmarking and evaluation of portfolio companies.

4.5 Main Results

Institutional investors that weigh their portfolios toward high-ranked ESG assets reduce the risk of the investment. Through survey question 1.8, we examine how often investors use ESG in considering specific types of risks in their investment management process. Table 4 shows that, on average, the respondents rate tail risk, litigation risk and relationship risk between 1.80 and 2.21. In contrast, the risks related to compliance and portfolio company reputation are seen as somewhat less important (between 2.59 and 2.63). Interestingly, the investors in our study tended to realize the correlation of ESG factors with returns and the potential to use ESG indicators as leading indicators for the future financial performance of investments. However, the evidence in Table 4 also shows that the respondents gave a much higher weight to the importance of ESG factors in measuring risks associated with investments. These results are consistent with expectations, and with the extant literature.

In Table 5, Panel A, we report on the motivations for incorporating specific risks into the investment process for a GP and an LP. To evaluate the intensity of ESG usage for specific risks, we asked investors how often, on a scale from 0 to 4, each type of risk motivates ESG considerations when making investments. The table also includes independent variables: "Assets under Management" (AUM) equals one (less than $1 billion), two (between $1 billion and $20 billion), 3 (between $20 billion and $50 billion), and 4 (greater than $50 billion). "Active" is the approximate percentage of assets under management invested actively versus passively In Panel A, we use dummy variables to distinguish between GPs and LPs. We classify GPs as investors who identified as a "private equity fund," "venture capital fund," or "hedge fund". We also control for all other investor types are classified as LPs (since they are primarily LPs in alternative investment managers and funds).

Table 5, Panel A focuses on the differences across investor types in terms of ESG intensity for specific forms of investment risk. The evidence suggests that reputational risk (vis-à-vis stakeholders) is the most relevant for GPs. In general, GPs are more strongly motivated by client demand (i.e. LP demand) than by an actual perceived link between risk and returns. This is consistent with the literature (Hoepner, 2010; De and Clayman, 2015; Cornell and Damodaran, 2020), that investigates the correlations of ESG factors with the riskiness of investments. As Table 5 highlights, respondents regard ESG factors as correlated with the reputational risk, regulatory risk and litigation risks associated with investments. Investors recognize that firms that invest in improving their ESG factors decrease the associated risks of fines for environmental regulations and, therefore, are better prepared for coping with future tightening regulations concerning emissions, energy usage, and pollution. The resulting liabilities associated with litigation and reputational damage are also mitigated by firms that proactively invest in improving ESG through investments in green energy and environmental sustainability (Berger-Walliser et al., 2016).

In the case of larger companies, the evidence suggests that they care more about stakeholder risk. However, considerations of all risks drop in North America; companies with more active investments are less motivated by ESG considerations for stakeholder, litigation, and tail risk. This finding supports the view that ESG is a hedge for longer-term and extreme events since more-actively-managed assets can be adapted and re-allocated quickly to such situations.

Table 5, Panel B reports that the relationship between ESG factors and risks seem to be particularly strong for alternative asset managers in the VC, PE and real estate infrastructure space. Panel B shows that regulatory risk and litigation risks are strongest motives for VC. One possible interpretation of this finding is that the longer-term horizon of these fund managers, who know that they will not be able to exit investments for years to come, keenly understand the importance of investing in firms that are prepared for future changes in the regulatory environment. The respondents also indicate that investors in the United States are more concerned with litigation and reputation risk than non-US investors are. Empirical evidence on the significantly higher US litigation costs is consistent with analysis of our findings reported in Panel B (Lawyers for Civil Justice, 2015).

It is noteworthy that, despite findings of strong empirical evidence for a correlation between tail risk and ESG for public equities (Shafer and Szado, 2020; Alburquerque et al., 2020), our

survey respondents indicated that this is their least- motivating risk factor for using ESG when evaluating alternative assets. The evidence suggests that these investors are most likely using ESG as a hedge for various regulatory and litigation risks (Pastor et al., 2021; Barnett et al., 2020).

It appears from the above analysis that institutional investors attach a higher importance to the role of ESG factors in mitigating tail risk and regulatory risk with respect to investments in their alternative asset portfolios.

4.5.1 Using ESG Data in the Investment Process

It is widely known that ESG data can convey material information that is related to financial performance (Amel-Zadeh and Serafeim, 2019; Amon et al., 2021). To understand how investors use ESG factors in the investment management process, we asked our participants to rank, in Question 1.7, each of the following purposes: screening criteria for exclusion of new investments; weight towards/away/completely exit existing investments; indicator of future financial returns; for benchmarking purposes and engaging the company in ESG issues. We asked respondents to answer the question on a scale from "never" (score of 0) to "always" (score of 4). Table 6 reports that respondents' strongest motives for using ESG data for the purpose of benchmarking (1.92) and conveying some information about future financial performance (1.36). The results above are consistent with the hypothesis that investors are more likely to use ESG to measure financial issues.

We now examine the intensity of GP and LP usage of ESG factors in their investment management process. The regressions are reported in Table 7. We start by noting that there is little direct relationship between AUM, and the intensity of ESG usage (models 1-3). However, our estimates suggest that GPs are statistically more likely to have higher ESG intensity (model 4), but this is largely correlated with geography, with US funds using ESG less intensively than UK funds, and both using it less intensively than continental European funds (model 5). Focusing on funds from the rest of the world (ROW), the estimates suggest that ROW funds use ESG more often than US, UK and European funds. There are a number of reasons why we might expect to see some companies embrace ESG strategies. One possibility is that a company's strategic commitment to ESG goals may signal to investors

that it is a high-quality company. Second, it is possible that it is simply a function of the large amount of capital being directed toward impact investing, which may benefit companies strongly affected by a positive investment environment. Models 6-7 report that PE funds use ESG more intensely than VC funds do, regardless of geography, though, again, US funds use ESG markedly less intensively (model 7). From the above analysis, it appears that the GP/LP distinction can also be interpreted as less-intense usage for earlier-stage investments.

To further examine the drivers of ESG intensity, we estimate regression models in Table 8, where the dependent variables are the rankings of respondents' perceived motivations and barriers to ESG usage of six topics. The dependent variables in Columns 1 to 3 are each respondents' rankings for explicit mandate, client demand, and ethics as motivations for ESG usage. In Columns 4 to 6, the dependent variables are the respondents' rankings for lack of standardized data, lack of reliable data, and poorly defined ESG factors as barriers to ESG usage. The values for all dependent variables range between one and five, and lower values indicate a more important motivation in columns 1 to 3 and a more important barrier in Columns 4 to 6. The results reported in Table 8 indicate that data availability and ethics motivations provide the greatest support to the stakeholder demand hypothesis. Our results conform to the view that MNEs operating in developing countries adopt more stringent environmental standards to signals companies' ESG responsiveness and, therefore, are more likely to be valued positively (Chen et al., 2018; Flammer, 2013).

4.5.2 Voice and Exit Related to ESG

In this section, we focus on the complementary use of voice and exit strategies by PEs and VCs with respect to their alternative investments. Table 9 shows the results of ordered logit regressions. The dependent variable intensity of ESG voice is an index based on the response to survey question 1.7(6), which asked respondents how often they engage companies (either directly or via GP/fund manager) in ESG-related issues. Interestingly, our results indicate that there is no statistically significant relationships between firm size (AUM) and the active share of the portfolio that uses voice and exit with respect to ESG considerations (models 1-3).

The second noteworthy finding is that the exit and voice channels are more often used by GPs (models 3, 5, and 8). This makes sense since they are more directly engaged in companies

and ultimately have the power to directly exit a company investment. Although our interviews do confirm that LPs will still address ESG concerns about a particular company with a GP, this is only for egregious reasons. Instead, most discussions with GPs about ESG characteristics focus on the fund level. In the main, most exit and voice interactions occur directly between GPs and target companies. This raises the issue of whether the implicit threat of exit by non-participation in subsequent funds and coinvestment opportunities means the exit-voice interactions can and do still occur between LPs and GPs. However, our interviewers tell us this is generally understood as a means to pressure the GP to directly engage with the company.

On the other hand, we can see an analogy to the arguments advanced by Bebchuck et al. (2017) that large institutional investors are incentivized to side with management on issues related to the public equities they hold. Consistent with this argument, LPs incentives are presumably aligned with GPs. Though we know from our interviews and our analysis here that GPs do engage directly with companies on ESG issues, they are generally of a secondary concern and depend on how egregious the ESG concern is. Instead, GPs may try to manage ESG at the fund level; similarly, LPs generally manage ESG concerns at the aggregate portfolio level. GPs and LPs can shuffle exposure internally among funds/accounts to ensure that ultimate investors/stakeholders' desired ESG profiles are met.

We also find that PEs use voice and exit more often than VCs do (models 4, 6 and 9). This makes sense since earlier-stage VC investments are generally less liquid than later-stage PE investments, and the focus of many interactions with nascent companies may also take a longer- term perspective on developing ESG. To be sure, this should not discount the role that voice and exit play with respect to ESG considerations, as it is statistically significant, but less so than with PE fund managers.

It is interesting to note that, geographically, exit and voice due to ESG concerns are used less frequently only in North America (models 5, 6, 8 and 9 in table 9) and, even then, are not universally robust and statistically significant across all models. Nonetheless, this is generally consistent with our other findings showing that, while still important, ESG is generally less important to US-based investors than to their counterparts in the rest of the world. These results are also consistent with survey results related to ESG considerations in the public-

equities space (Amel-Zadeh and Serafeim, 2018; Eccles et al., 2011; Krueger et al., 2019; Brandon et al., 2021).

Furthermore, we document that GPs use exit and voice more often than LPs. While our interview evidence confirms that LPs will address ESG concerns about a particular company with a GP, this is only for egregious concerns. Our findings highlight, among other things, that LPs do not have the same significant effect on governance that GPs have.

4.5.3 Relative E, S, and G Preferences

The results above demonstrate the importance of investors' engagement strategies to address ESG concerns about a particular company. In this section, we examine investors' beliefs about the relative importance of E, S and G scores individually. Table 10, Panel A reports our findings on investors' preferences with respect to the individual E, S, and G components. The respondents, on average, rate the three components between 1.82 and 2.46, which means that G is considered important.

The results reported in Table 10, Panel B indicate that G is more important to larger institutional investors. Our findings conform with recent empirical studies showing that institutional investors generally, and the Big Three in particular, are not only drawn to all firms with higher ESG scores, but are most significantly drawn to firms with high G scores.[29]

4.6 Conclusion

In this paper, we present the results of our survey of institutional investors and alternative asset managers to better understand the challenges and opportunities of incorporating ESG into their investment management processes. Our new data set is constructed based on a 2020 survey of 106 institutional investors from Europe and North America, as well as a small percentage of respondents from around the world. Our data allow us to shed light on the intensity and use of ESG by LPs and PE and VC firms. First, we find that LPs are motivated to incorporate ESG, because they believe that ESG usage is more strongly correlated with

[29] See Chapter 3 of this thesis.

financial performance. GPs are motivated to integrate ESG factors into their investment strategies in response to increased client demand for sustainable products. Second, we find that PE firms use ESG factors more intensively than VC firms regardless of geography. Third, we consider that investors can choose between voice and exit in their approach to ESG investing. We find that PE firms use voice and exit strategies more extensively than VC funds in efforts to promote ESG activities in companies. Finally, we find that the investors consider that the governance score the most important component of ESG.

The findings of this paper make three contributions to the literature. First, the paper provides new insights into the importance that LPs and GPs place on ESG, highlighting the motivations and barriers to ESG usage. Second, we contribute to the literature on ESG integration by PE and other alternative asset classes by showing the PE firms are more likely than VC firms to use ESG more intensively, regardless of where the alternative asset managers are located. Third, we contribute to the literature on investor engagement on ESG by analyzing the use of voice and exit by LPs and GPs and our findings that PEs use voice and exit more often than VCs.

4.7 Tables

Table 1 – Survey respondents' demographic characteristics

This table provides summary statistics of the 106 survey respondents. Demographic data include institutional investor type (survey question 2.1); size measured in US dollar amount of assets under management (survey question 2.4); the approximate percentage of assets under management invested actively versus passively (survey question 2.3); geographic headquarters of institutional investor (survey question 2.2); the position title or titles of the primary person or persons responsible for the ESG factors in the investment process (survey question 1.1); the type of any ESG-related mandates the investor has (survey question 1.3); and the overall style of ESG usage in the investment process (survey question 1.4).

Survey respondents' demographic characteristics (n=106)

Investor type	Percentage
private equity fund	39%
pension fund	19%
venture capital fund	17%
asset manager	13%
hedge fund	6%
insurance company	6%

Assets under management	Percentage
less than USD 1 billion	17%
between USD 1 billion and 20 billion	41%
between USD 20 billion and 50 billion	24%
more than USD 50 billion	18%

Portfolio active share	
mean	0.815

Region	Percentage
Europe (ex-UK)	32%
North America	29%
United Kingdom	12%
Asia	10%
Australia / New Zealand	6%
Middle East / Africa	6%
South America	5%

Position(s) responsible for ESG	Percentage
investment analyst	44%
portfolio manager	38%
internal ESG specialist	37%
no specific person	9%

ESG mandate	Percentage
no ESG-related mandate	41%
ESG factors generally	48%
corporate governance focus	3%
environmental focus	3%
environmental and corporate governance focus	3%
environmental and social responsibility focus	1%
social responsibiltiy focus	1%

overall ESG usage style	Percentage
for every potential and existing investment	55%
for new investments only	6%
only on aggregate portfolio or fund level	5%
on a case by case basis	26%
rarely or never examine ESG criteria	5%

Table 2 – Motivations for and barriers to ESG usage

Panel A presents survey respondents' rankings of their top four motivations for incorporating ESG into the investment management process (survey question 1.5). Panel B presents the survey respondents' rankings of what they perceive as the top four barriers to ESG usage (survey question 1.6). A response of "1" indicates that the topic is the most important to the respondent. Responses with fewer than four rankings were permitted. Column 1 reports the percentage of respondents who ranked the topic as number "1"; Column 2 reports the percentage of respondents who ranked the topic as either "1" or "2." For statistical calculations in Columns 3-5, unranked topics were assigned a rank of "5," Column 3 presents the mean rank for that topic. Lower mean ranks imply that the topic is more important, on average, to the respondents (i.e., a bigger motivation for survey question 1.5 or a bigger barrier for survey question 1.6). Column 4 presents the results of a t-test of the null hypothesis that the mean rank for each topic is equal to "5" (*** indicate significance at the 1 percent level). Column 5 presents the results of a t-test of the null hypothesis that the mean rank for a given topic is equal to the mean rank for each of the other topics, where significant differences at the 10% level are reported.

		Percentage rank 1	Percentage rank 1 or 2	mean rank	test for Ho: mean rank = 5	significant differences in mean rank vs rows
	A. ESG motivations ranking (n=106)	1	2	3	4	5
1	explicit investment mandate	38%	45%	3.01	***	3-5,7
2	client demand / interest	16%	39%	3.31	***	3-7
3	ethical considerations	2%	8%	4.54	***	1-2,4-7
4	positively correlated with financial returns	6%	24%	3.86	***	1-3,5-6
5	diversification purposes	2%	13%	4.28	***	1-2,4,6-7
6	ESG is related to investment risk	30%	48%	2.78	***	2-5,7
7	part of fiduciary duty	6%	19%	3.73	***	1-3,5-6

		Percentage rank 1	Percentage rank 1 or 2	mean rank	test for Ho: mean rank = 5	significant differences in mean rank vs rows
	B. ESG barriers ranking (n=106)	1	2	3	4	5
1	lack of standardized data for comparability	34%	53%	2.48	***	2-7
2	negatively correlated with financial returns	9%	13%	4.37	***	1,4-7
3	unrelated to investment performance	6%	10%	4.52	***	1,4,6-7
4	conflicts with fiduciary duty	0%	4%	4.81	***	1-3,5-7
5	unrelated to risk	2%	4%	4.67	***	1,2,4,6-7
6	lack of trustworthy / reliable data	17%	46%	3.04	***	1,2,4-5,7
7	ESG factors are poorly / ambiguously defined	32%	44%	2.87	***	1,2,4-6

Table 3 – GPs versus LPs on motivations and barriers to ESG usage

Panel A presents a comparison of GP and LP respondents' mean rankings of ESG motivations (survey question 1.5), and panel B presents the same comparison for the mean rankings of barriers to ESG (survey question 1.6). We classify GPs as investors who identified as a "private equity fund," "venture capital fund," or "hedge fund" in their response to survey question 2.1. All other investor types are classified as LPs (since they are primarily LPs in alternative investment managers and funds). Column 1 reports the mean rank for all respondents, column 2 the mean rank for GPs, and column 3 the mean rank for LPs. (Lower mean ranks imply that the topic is more important, on average, to the respondents (i.e., a bigger motivation for survey question 1.5 or a bigger barrier for survey question 1.6)). Column 4 presents the difference in means between GP and LP scores for each topic. And Column 5 presents the results of a t-test of the null hypothesis that the mean rank for GPs is equal to the mean rank for LPs (** indicate significance at the 5 percent level).

		all respondents mean rank (n=106)	GP mean rank (n=66)	LP mean rank (n=40)	difference in mean ranks between GPs and LPs (GP-LP)	significant difference in means
	A. ESG motivations ranking	1	2	3	4	5
1	explicit investment mandate	3.01	2.66	3.58	-0.92	**
2	client demand / interest	3.31	2.97	3.86	-0.89	**
3	ethical considerations	4.54	4.43	4.72	-0.29	
4	positively correlated with financial returns	3.86	3.98	3.66	0.32	
5	diversification purposes	4.28	4.41	4.07	0.34	
6	ESG is related to investment risk	2.78	3.11	2.24	0.87	**
7	part of fiduciary duty	3.73	3.71	3.76	-0.05	

		all respondents mean rank (n=106)	GP mean rank (n=66)	LP mean rank (n=40)	difference in mean ranks between GPs and LPs (GP-LP)	significant difference in means
	B. ESG barriers ranking	1	2	3	4	5
1	lack of standardized data for comparability	2.48	2.55	2.37	0.18	
2	negatively correlated with financial returns	4.37	4.14	4.75	-0.61	**
3	unrelated to investment performance	4.52	4.41	4.70	-0.29	
4	conflicts with fiduciary duty	4.81	4.75	4.91	-0.16	
5	unrelated to risk	4.67	4.64	4.72	-0.08	
6	lack of trustworthy / reliable data	3.04	3.03	3.06	-0.03	
7	ESG factors are poorly / ambiguously defined	2.87	2.93	2.77	0.16	

Table 4 – ESG and specific risks

This table shows how often investors use ESG in considering specific types of risks in their investment management process (survey question 1.8). Answers can range from “never” to “always.” Column 1 shows how many respondents answered “always” for each risk type, and Column 2 shows how many respondents replied either “always” or “most of the time.” For statistical calculations in columns 3-5, we scored “never” responses as “0,” “sometimes” as “1,” “about half the time” as “2,” “most of the time” as “3,” and “always” as “4.” Column 3 presents the mean scores for each risk type, with higher mean scores indicating more frequent usage in relation to that risk type. Column 4 presents the results of a t-test of the null hypothesis that the mean score for each risk type is equal to “4” (*** indicate significance at the 1 percent level). Column 5 presents the results of a t-test of the null hypothesis that the mean score for a given risk type is equal to the mean score for each of the other risk types, with significant differences at the 10% level reported.

		Percentage responding "always" (n=106)	Percentage responding "always" or "most of the time" (n=106)	mean score (n=106)	test for Ho: mean score = 0	significant differences in mean rank vs rows
	Types of risk motivating ESG considerations	1	2	3	4	5
1	regulatory / compliance risk	42%	60%	2.59	***	3-5
2	portfolio company reputational risk	35%	64%	2.63	***	3-5
3	investor (LPs, stakeholders, etc) relationship risk	22%	52%	2.21	***	1-2,5
4	litigation risk	27%	42%	2.02	***	1-2
5	tail risk	18%	34%	1.80	***	1-3

Table 5 – GPs versus LPs and PEs versus VCs across specific risks

This table shows the results of ordered logit regressions. The dependent variables are the survey's responses on how strongly ESG usage is based on considerations of specific risk categories (survey questions 1.8(1) to 1.8(5), asking respondents how often each type of risk motivates ESG considerations when making investments). We scored "never" responses as "0," "sometimes" as "1," "about half the time" as "2," "most of the time" as "3," and "always" as "4." As such, each dependent variable can range from 0 to 4. "AUM" indicates the size of an investor and takes the values 1 (less than USD 1 billion), 2 (between USD 1 and 20 billion), 3 (between USD 20 and 50 billion), and 4 (greater than 50 billion) (survey question 2.4). "Active" is the approximate percentage of assets under management invested actively versus passively (survey question 2.3).

Panel A uses dummy variables to distinguish between GPs and LPs. We classify GPs as investors who identified as a "private equity fund," "venture capital fund," or "hedge fund" (survey question 2.1). All other investor types are classified as LPs (since they are primarily LPs in alternative investment managers and funds).

In Panel B, we use dummy variables to separately distinguish between venture capital funds ("VC") and private equity funds ("PE"). This can be interpreted as a differentiation for early-stage ("VC") and later-stage ("PE") investments in private equity. Dummy variables are also used to distinguish geographic location of investors (survey question 2.2).

Panel A. Drivers of ESG motivations for specific risks with focus on GP/LP

Dependent variables: intensity of ESG usage for specific risks	regulatory risk	portfolio company reputational risk	stakeholder (investor, LP) relationship risk	litigation risk	tail risk
	1	2	3	4	5
AUM	0.26	0.18	0.45**	0.39**	0.38*
	(0.20)	(0.19)	(0.20)	(0.20)	(0.20)
active	-1.38	-0.69	-1.42*	-1.65*	-1.46*
	(0.86)	(0.81)	(0.79)	(0.86)	(0.82)
GP	1.10**	0.32	0.92**	0.85*	-0.09
	(0.45)	(0.42)	(0.42)	(0.44)	(0.42)
Europe	-1.12**	-1.18**	-0.14	-0.81*	-0.86*
	(0.56)	(0.52)	(0.48)	(0.49)	(0.50)
North America	-2.60***	-2.13***	-1.04*	-2.48***	-1.38***
	(0.59)	(0.56)	(0.53)	(0.57)	(0.52)
UK	-1.04	-1.05	0.13	-0.34	-1.17*
	(0.73)	(0.70)	(0.67)	(0.72)	(0.70)
n	106	106	106	106	106
pseudo R-sq	0.114	0.062	0.047	0.098	0.036

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Panel B. Drivers of ESG motivations for specific risks with focus on PE/VC

Dependent variables: intensity of ESG usage for specific risks	regulatory risk	portfolio company reputational risk	stakeholder (investor, LP) relationship risk	litigation risk	tail risk
	1	2	3	4	5
AUM	0.25	0.21	0.46**	0.37*	0.45**
	(0.21)	(0.20)	(0.20)	(0.20)	(0.20)
active	-1.41	-0.53	-1.35*	-1.78**	-1.05
	(0.88)	(0.82)	(0.80)	(0.88)	(0.84)
VC	1.17*	-0.04	0.76	1.13**	-0.98*
	-0.61	-0.54	-0.55	-0.57	-0.55
PE	1.06**	0.57	1.03**	0.66	0.48
	(0.52)	(0.49)	(0.48)	(0.50)	(0.48)
Europe	-1.15**	-1.04*	-0.08	-0.92*	-0.54
	(0.58)	(0.53)	(0.50)	(0.51)	(0.52)
North America	-2.65***	-1.89***	-0.93	-2.66***	-0.84
	(0.66)	(0.61)	(0.58)	(0.62)	(0.57)
UK	-1.06	-0.9	0.21	-0.44	-0.88
	(0.74)	(0.72)	(0.70)	(0.72)	(0.70)
n	106	106	106	106	106
pseudo R-sq	0.114	0.065	0.048	0.100	0.055

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 6 – ESG usage in the investment management process

This table shows how often investors use ESG for the following purposes in their investment management process (survey question 1.7). Answers can range from “never” to “always.” Column 1 shows how many respondents answered “always” for each purpose, and Column 2 shows how many respondents replied either “always” or “most of the time.” For statistical calculations in Columns 3-5, we scored “never” responses as “0,” “sometimes” as “1,” “about half the time” as “2,” “most of the time” as “3,” and “always” as “4.” Column 3 presents the mean scores for each purpose, with higher mean scores indicating more frequent usage for that purpose, on average. Column 4 presents the results of a t-test of the null hypothesis that the mean score for each purpose is equal to “4” (*** indicate significance at the 1 percent level). Column 5 presents the results of a t-test of the null hypothesis that the mean score for a given purpose is equal to the mean score for each of the other purposes, with significant differences at the 10% level reported.

		Percentage responding "always" (n=106)	Percentage responding "always" or "most of the time" (n=106)	mean score (n=106)	test for Ho: mean score = 0	significant differences in mean rank vs rows
	Frequency of ESG usage for the following purposes:	1	2	3	4	5
1	screening criteria for exclusion of new investments	44%	57%	2.42	***	2-3,5-6
2	weight towards/away/completely exit existing investments	26%	42%	2.06	***	1,3-4,6
3	indicator of future financial returns	10%	23%	1.36	***	1-2,4-6
4	indicator of riskiness	29%	52%	2.36	***	2-3,5-6
5	for benchmarking purposes	23%	40%	1.92	***	1,3-4,6
6	engage company (directly or via GP/fund manager) on ESG issues	55%	71%	2.94	***	1-5

Table 7 – ESG Usage Intensity

This table shows the results of ordered logit regressions. The dependent variable "intensity of ESG usage" is an index based on the responses to survey questions 1.7(1) to 1.7(6), which ask respondents how often they use ESG for various purposes in the investment management process. We scored "never" responses as "0," "sometimes" as "1," "about half the time" as "2," "most of the time" as "3," and "always" as "4." As such, this variable can range from 0 to 24. "AUM" indicates the size of an investor and takes the values 1 (less than USD 1 billion), 2 (between USD 1 and 20 billion), 3 (between USD 20 and 50 billion), and 4 (greater than 50 billion) (survey question 2.4). "Active" is the approximate percentage of assets under management invested actively versus passively (survey question 2.3). We use dummy variables to distinguish between GPs and LPs. We classify GPs as investors who identified as a "private equity fund," "venture capital fund," or "hedge fund" (survey question 2.1). All other investor types are classified as LPs (since they are primarily LPs in alternative investment managers and funds). We also use dummy variables to separately distinguish between venture capital funds ("VC") and private equity funds ("PE"). This can be interpreted as a differentiation for early-stage ("VC") and later-stage ("PE") investments in private equity. Dummy variables are also used to distinguish the geographic locations of investors (survey question 2.2).

Dependent variable: intensity of ESG usage							
	1	2	3	4	5	6	7
AUM	0.17		0.17	0.39**	0.48**	0.48**	0.52***
	(0.18)		(0.18)	(0.19)	(0.20)	(0.20)	(0.20)
active		-0.03	-0.06	-0.96	-1.31*	-0.72	-1.09
		(0.64)	(0.64)	(0.72)	(0.73)	(0.73)	(0.75)
GP				1.30***	1.01**		
				(0.42)	(0.43)		
VC						0.41	0.5
						(0.54)	(0.54)
PE						1.76***	1.39***
						(0.46)	(0.49)
Europe					-1.12**		-0.91*
					(0.48)		(0.50)
North America					-1.42***		-1.13**
					(0.51)		(0.54)
UK					-1.09		-0.83
					(0.68)		(0.68)
n	106	106	106	106	106	106	106
pseudo R-sq	0.002	0.001	0.002	0.018	0.033	0.030	0.038

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 8 – Drivers of ESG usage intensity outside of Europe and North America

This table shows the results of ordered logit regressions. The dependent variables are the rankings of investors' reported motivations for and barriers to ESG usage with regard to six topics. The dependent variables in Columns 1-3 are the rankings for explicit mandate (survey question 1.5(1)), client demand (survey question 1.5(2)), and ethics (survey question 1.5(3) as motivations for ESG usage. The dependent variables in Columns 4-6 are the rankings for lack of standardized data (survey question 1.6(1)), lack of reliable data (survey question 1.6(6)), and poorly defined ESG factors (survey question 1.6(7)) as barriers to ESG usage. The values for all dependent variables range from 1-5, and lower values indicate a more important motivation in Columns 1-3 and a more important barrier in Columns 4-6. "AUM" indicates the size of an investor and takes the values 1 (less than USD 1 billion), 2 (between USD 1 and 20 billion), 3 (between USD 20 and 50 billion), and 4 (greater than 50 billion) (survey question 2.4). "Active" is the approximate percentage of assets under management invested actively versus passively (survey question 2.3). "ROW" is a dummy variable for geographic location; it takes the value of "0" for investors located in North America, the UK, and Europe (ex-UK) and "1" for investors located in the rest of the world.

Dependent variables: rankings of specific hurdles and motivations for ESG usage	explicit mandate as a motivation	client demand as a motivation	ethics as a motivation	lack of standardized data as a hurdle	lack of reliable data as a hurdle	poorly defined factors as a hurdle
	1	2	3	4	5	6
AUM	0.01	-0.21	0.92***	-0.26	-0.18	-0.3
	(0.19)	(0.19)	(0.31)	(0.20)	(0.20)	(0.19)
active	0.08	-0.87	-0.85	-0.9	0.42	0.89
	(0.74)	(0.73)	(1.07)	(0.72)	(0.70)	(0.71)
ROW	-0.6	-1.32***	-0.85*	0.94**	0.82*	0.19
	(0.41)	(0.44)	(0.52)	(0.42)	(0.43)	(0.40)
n	106	106	106	106	106	106
pseudo R-sq	0.009	0.040	0.104	0.031	0.021	0.017

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 9 – Voice and Exit related to ESG

This table shows the results of ordered logit regressions. The dependent variable "intensity of ESG voice" is an index based on the responses to survey question 1.7(6), which asks respondents how often they engage companies (either directly or via GP/fund manager) in ESG-related issues. We scored "never" responses as "0," "sometimes" as "1," "about half the time" as "2," "most of the time" as "3," and "always" as "4." As such, this variable can range from 0 to 4. "AUM" indicates the size of an investor and takes the values 1 (less than USD 1 billion), 2 (between USD 1 and 20 billion), 3 (between USD 20 and 50 billion), and 4 (greater than 50 billion) (survey question 2.4). "Active" is the approximate percentage of assets under management invested actively versus passively (survey question 2.3). We use dummy variables to distinguish between GPs and LPs. We classify GPs as investors who identified as a "private equity fund," "venture capital fund," or "hedge fund" (survey question 2.1). All other investor types are classified as LPs (since they are primarily LPs in alternative investment managers and funds). We also use dummy variables to separately distinguish between venture capital funds ("VC") and private equity funds ("PE"). This can be interpreted as a differentiation for early-stage ("VC") and later-stage ("PE") investments in private equity. Dummy variables are also used to distinguish geographic locations of investors (survey question 2.2). "Exit due to ESG" is an index based on the responses to survey question 1.7(2), which asks how often respondents have exited an investment due to ESG. We scored "never" responses as "0," "sometimes" as "1," "about half the time" as "2," "most of the time" as "3," and "always" as "4"; as such, this variable can range from 0 to 4.

Dependent variable: intensity of ESG voice									
	1	2	3	4	5	6	7	8	9
AUM	-0.05		0.29	0.26	0.43*	0.24		0.35	0.06
	(0.20)		(0.23)	(0.22)	(0.24)	(0.22)		(0.25)	(0.24)
active		0.6	-0.15	-0.66	-1.03	-1.1		-0.34	-0.36
		(0.76)	(0.81)	(0.86)	(0.88)	(0.91)		(0.94)	(0.98)
GP			1.62***		2.02***			2.33***	
			(0.56)		(0.60)			(0.64)	
VC				1.95***		2.11***			2.51***
				(0.64)		(0.65)			-0.69
PE				2.17***		1.90***			1.77***
				(0.53)		(0.57)			-0.59
Europe					-0.85	-0.87		-0.26	-0.45
					(0.58)	(0.58)		(0.61)	(0.61)
North America					-1.69***	-0.93		-1.25**	-0.63
					(0.57)	(0.63)		(0.60)	(0.66)
UK					-0.42	-0.25		0.24	0.18
					(0.80)	(0.81)		(0.85)	(0.83)
exit due to ESG							0.45***	0.53***	0.55***
							(0.15)	(0.17)	(0.18)
n	106	106	106	106	106	106	106	106	106
pseudo R-sq	0.001	0.003	0.037	0.088	0.076	0.101	0.041	0.120	0.142

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 10 – Relative E, S, and G preferences

This table examines the relative importance of E, S, and G factors to investors based on responses to survey question 1.9, asking respondents to rank the importance of each factor. Answers range from "1," meaning most important, to "4," meaning not important. The same ranking can be used for factors that are equally important to the respondent. Note that a lower value for these responses indicates that the factor is more important and a higher value indicates that it is less important, with "4" indicating that it is not important at all.

Panel A shows summary statistics about the ranks given to E, S, and G factors based on the responses to survey questions 1.9(1), 1.9(2), and 1.9(3). Column 1 shows how many respondents ranked each factor as "1," and column 2 shows how many respondents ranked each factor as either "1" or "2." Column 3 presents the mean scores for each purpose, where lower mean scores indicate that the factor is more important, on average. Column 4 presents the results of a t-test of the null hypothesis that the mean score for each factor is equal to "4" (*** indicate significance at the 1 percent level). Column 5 presents the results of a t-test of the null hypothesis that the mean score for a given factor is equal to the mean score for each of the other factors, with significant differences at the 10% level reported.

Panel B shows the results of ordered logit regressions. The dependent variables are indices based on the answers to survey questions 1.9(1), 1.9(2), and 1.9(3), which ask respondents to rank how important E, S, and G factors are in evaluating investments. In models 1-3, the dependent variable is based on question 1.9(1) and indicates the rank of E factors; in models 4-6, the dependent variable is based on question 1.9(2) and represents the rank of S factors; and in models 7-9, the dependent variable is based on question 1.9(3) and represents the rank of G factors. "AUM" indicates the size of an investor and takes the values 1 (less than USD 1 billion), 2 (between USD 1 and 20 billion), 3 (between USD 20 and 50 billion), and 4 (greater than 50 billion) (survey question 2.4). "Active" is the approximate percentage of assets under management invested actively versus passively (survey question 2.3). We use dummy variables to distinguish between GPs and LPs. We classify GPs as investors who identified as a "private equity fund," "venture capital fund," or "hedge fund" (survey question 2.1). All other investor types are classified as LPs (since they are primarily LPs in alternative investment managers and funds). We also use dummy variables to separately distinguish between venture capital funds ("VC") and private equity funds ("PE"). This can be interpreted as a differentiation for early-stage ("VC") and later-stage ("PE") investments in private equity. Dummy variables are also used to distinguish geographic locations of investors (survey question 2.2).

Panel A: E, S, and G importance rankings

	Percentage responding "1" (n=106)	Percentage responding "1" or "2" (n=106)	mean score (n=106)	test for Ho: mean score = 4	significant differences in mean rank vs rows
E, S, and G importance rankings	1	2	3	4	5
Environmental Factors	24%	72%	2.16	***	2-3
Social Factors	23%	45%	2.46	***	1,3
Governance Factors	59%	68%	1.82	***	1-2

Panel B: Drivers of relative E, S, and G importance

Dependent variable: E, S, and G ranking	E ranking			S ranking			G ranking		
	1	2	3	4	5	6	7	8	9
AUM	-0.22	-0.32	-0.32	-0.15	-0.18	-0.23	-0.50**	-0.49**	-0.42*
	(0.20)	(0.21)	(0.21)	(0.20)	(0.21)	(0.21)	(0.23)	(0.23)	(0.24)
active	0.22	0.72	0.7	-0.05	0.08	-0.1	-0.15	-0.24	-0.02
	(0.74)	(0.78)	(0.80)	(0.75)	(0.79)	(0.81)	(0.82)	(0.87)	(0.90)
Europe	0.36	0.22	0.2	0.85*	0.82	0.66	0.8	0.82	1.05*
	(0.52)	(0.52)	(0.54)	(0.50)	(0.50)	(0.52)	(0.52)	(0.53)	(0.56)
North America	0.5	0.22	0.18	1.99***	1.94***	1.69***	0.05	0.1	0.48
	(0.52)	(0.54)	(0.59)	(0.53)	(0.54)	(0.59)	(0.57)	(0.61)	(0.66)
UK	1.09	0.73	0.7	1.16	1.06	0.95	-0.65	-0.58	-0.32
	(0.68)	(0.70)	(0.72)	(0.74)	(0.76)	(0.76)	(0.90)	(0.92)	(0.94)
GP		-0.99**			-0.23			0.14	
		(0.44)			(0.44)			(0.49)	
VC			-0.94			0.16			-0.44
			(0.58)			(0.58)			(0.66)
PE			-1.03**			-0.48			0.53
			(0.51)			(0.50)			(0.56)
n	106	106	106	106	106	106	106	106	106
pseudo R-sq	0.014	0.036	0.036	0.062	0.063	0.067	0.047	0.047	0.056

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

1.1 Appendix

Survey instrument

Survey on investor preferences regarding ESG with respect to alternative asset classes

Introduction

We are a team of researchers from Tilburg University in the Netherlands. We are engaged in a research project that seeks to attain a better understanding of how investors consider ESG (environmental, social, and governance) factors in the investment-analysis and decision-making process, with a focus on alternative asset classes.

We kindly ask you to take the time to complete a short survey we have created.

We take the confidentiality of responses very seriously. All survey responses are strictly anonymous. We will not share your responses with anyone; nor will individual firms or respondents be identified. Only aggregate data will be made public. Moreover, we will not link the survey responses to any other data.

If you have any questions, please contact us at: p.c.pudschedl@uvt.nl or j.a.mccahery@uvt.nl

Thank you very much for participating in this survey.

Evaluating ESG factors of target investments

1.1: Which best describes the position(s) of the person(s) responsible for decisions related to ESG (Environmental, Social, and Governance) factors in your investment process? (Check all that apply.)

☐ Investment analyst
☐ Portfolio manager
☐ Internal ESG specialist
☐ External consultant / advisor
☐ No specific person
☐ Other: _____

1.2: Does your organization have a dedicated, in-house "ESG analyst" or similar professional to explicitly consider the ESG criteria of investments?

☐ Yes
☐ No
☐ Not sure / don't know

1.3: Do you have an investment mandate to invest in companies with regard to any of the following characteristics?

☐ environmental focus
☐ social responsibility focus
☐ corporate governance focus
☐ environmental and social responsibility focus
☐ environmental and corporate governance focus
☐ social responsibility and corporate governance focus
☐ ESG factors generally
☐ no ESG-related mandate

1.4: Which statement best describes how you consider ESG factors when evaluating an investment?

☐ on a case-by-case basis
☐ only on aggregate portfolio / fund level
☐ for every potential and existing investment
☐ for new investments only
☐ for existing investments only
☐ rarely or never examine ESG criteria

1.5: Of the following, please rank what you consider the four most important reasons for analyzing ESG factors when making an investment decision (1 being the most important).

_____ explicit investment mandate (1)
_____ client demand / interest (2)
_____ personal ethical considerations (3)
_____ ESG factors are positively correlated with financial returns (4)
_____ diversification purposes (5)
_____ ESG factors are related to investment riskiness (6)
_____ part of fiduciary duty (7)

1.6: Of the following, please rank what you consider the top four barriers to considering ESG factors when making an investment decision (1 being the biggest barrier to considering ESG factors).

_____ lack of standardized ESG data for comparability (1)
_____ ESG factors are negatively correlated with financial returns (2)
_____ ESG factors are unrelated to investment performance (3)
_____ considering ESG factors would conflict with fiduciary duty (4)
_____ ESG factors are unrelated to investment risk (5)
_____ lack of trustworthy/reliable ESG data (6)
_____ ESG factors are poorly / ambiguously defined (7)

1.7: How often do you use ESG factors in the investment decision making process in the following manners?

	Always	Most of the time	About half the time	Sometimes	Never
as a screening criterion to decide whether or not to exclude potential investments from further consideration? (1)	○	○	○	○	○
to consider weightings towards/away as well as total exits from existing investments? (2)	○	○	○	○	○
as an indicator of future financial returns? (3)	○	○	○	○	○
as an indicator of riskiness of an investment? (4)	○	○	○	○	○
to benchmark / compare portfolio companies? (5)	○	○	○	○	○
to engage portfolio companies (directly or via GP/fund manager) on ESG issues? (6)	○	○	○	○	○

1.8: What types of risk motivate the consideration of ESG factors in the investment process?

	Always	Most of the time	About half the time	Sometimes	Never
regulatory / compliance risk (1)	○	○	○	○	○
portfolio company reputational risk (2)	○	○	○	○	○
Investor (LPs, other stakeholders, etc.) relationship risk (3)	○	○	○	○	○
litigation risk (4)	○	○	○	○	○

tail risk (5)

○ ○ ○ ○ ○

1.9: Please rank the importance of the following three factors in your investment decision-making process. Rank the most important factor as 1. If more than one factor is equally important, you can enter the same rank for the equally important factors. Enter a 0 for factors that are not important to your investment decision making process.

_____ environmental factors (1)
_____ social and corporate responsibility criteria (2)
_____ corporate governance structures or factors (3)

General information

2.1: The fund/institution where I work can be best described as:

☐ Hedge fund
☐ Pension fund
☐ Insurance company
☐ Private equity fund
☐ Asset management for pension funds, endowments, and other managed accounts
☐ Venture capital fund
☐ Other (please explain): _____

2.2: Where is your fund/institution geographically headquartered:

☐ North America
☐ United Kingdom
☐ Europe (ex-UK)
☐ Australia or New Zealand
☐ Asia
☐ South America
☐ Middle East or Africa

2.3: Approximately what percentage of your portfolio is invested actively versus passively?

___ % in active investment
___ % in passive investment

2.4: What is the total size of assets under management for your organization?

☐ less than USD 1 billion

- [ ] between USD 1 billion and USD 20 billion
- [ ] between USD 20 billion and USD 50 billion
- [ ] more than USD 50 billion

Semi-structured interviews instrument

ITEM	AGENDA	POSSIBLE QUESTIONS
	Demographic information	Position title, type of institutional investor, location, size (AUM), ESG-related mandates, types of alternative assets
1	Recap on the investor's approach towards ESG in investments in alternative assets	Do you treat ESG differently than any other material investment risk and if so why and how?
	Motivations for using ESG in the investment process; barriers to using ESG	
2	Specifics for institutional investors active in different asset classes	Questions for institutional investors who are primarily LPs in alternative investment funds
A	Differences in ESG approaches	How does your approach differ for the different asset classes you manage?
B	Selection of Investment Managers and ESG criteria there	Are the ESG-related criteria for selecting an investment manager or investment fund different per asset class you manage, and if so, how?
3	ESG during the holding period of the investment	Questions for all alternative asset managers
A	Engagement	How do you decide on which ESG topics/ degree of materiality the investor would engage?
B	Other follow-up/mitigation, etc.	How do you, in general, follow up on material/non-material ESG matters during the holding period of an investment? When would you consider exiting an investment because of ESG factors? What is the interaction like between GPs, LPs, and companies related to ESG issues?

4	Outside advice and how the investor deals with it	Recap on ESG data providers: how often do you follow/not follow their advice? How do you analyze and compare ESG data across asset classes?
A	ESG data providers	Do you use Proxy Advisors? How often do you follow/not follow their advice?
B	Proxy advisors and other ESG data providers	If you do not follow their advice, when does this happen?
5	Disclosure, reporting and preferred ESG standards	What form or method of ESG disclosure do you prefer?
A	Their own reporting	What form of ESG reporting do you consider most effective?
B	Reporting and disclosure of investees	What frameworks should companies focus on to best communicate ESG information?
		What steps do you take to verify the ESG related claims and disclosures?
6	ESG and climate risk	What connection do you see between ESG and climate risk?

5 Corporate Governance and Value Preservation: The Effect of the FinCEN Leak on Banks

Abstract

We examine the market response to the disclosure of suspicious activity reports (SARs), made public as part of the FinCEN leak. We find a significant negative stock market reaction the days after the database was made public. To further examine the effects of the FinCEN leak, we study whether the fines imposed on US banks will have a negative impact on market valuations. Using a unique dataset, we document a negative market reaction after the event. We find that financial institutions with better governance have fewer regulatory fines and suffer less financial market effects from the announcement of these fines. Furthermore, we find evidence of fewer instances of advance leakage around fine announcements. Finally, our results show that institutional investors diversify holdings away from banks with larger fines.

5.1 Introduction

Money laundering and other financial crimes have emerged in recent years as a significant threat to capital markets and to the fiscs of many states. For example, Global Financial Integrity (2020) estimates that trade-based money laundering and tax evasion accounted for about a $8.7 trillion loss for developing countries between 2008 and 2017. Recognizing these risks, the United States's Bank Secrecy Act of 1970 requires financial institutions to collaborate with the U.S. government to help identify and prevent money laundering and tax evasion activities.[30] In particular, a Suspicious Activity Report (SAR) must be filed when an employee or individual has reason to suspect that a customer may be involved in suspicious transactions.[31] Even though banks and financial institutions are subject to penalties by state and federal authorities if they fail to report suspicious activities, they are less incentivized to investigate suspicious activities of valued clients or large transactions if the commercial value to the bank may offset penalty costs. Moreover, the type and magnitude of SARs filed varies significantly across countries, and the number of SAR filings has almost doubled in the

[30] Bank Secrecy Act of 1970, Pub. L. No. 91-508, 84 Stat. 1114–36 (codified as amended in scattered sections of 12 U.S.C., 15 U.S.C., and 31 U.S.C.).
[31] *See*, *e.g.*, 31 U.S.C. § 5318(g)(1) (noting that "[t]he Secretary may require any financial institution, and any director, officer, employee, or agent of any financial institution, to report any suspicious transaction relevant to a possible violation of law or regulation.").

United States over the last decade.[32] For example, in 2019 alone, more than 2.7 million SARs were filed in the United States, with approximately eighty-five percent filed by financial institutions.[33] This phenomenon may reflect a regime in which "the rules around what is deemed 'suspicious' can be vague, which leads some banks to send too many reports and others to send too few" (Schroeder, 2020).

In September 2020, Buzzfeed News and the International Consortium of Investigative Journalists (ICIJ) jointly published a cache of records known colloquially as the "FinCEN Files" (Schroeder, 2020). The leak was the latest in a line of recent exposés targeting the aggressive tax planning and avoidance strategies—and, in some cases, outright tax evasion—employed by corporations, global elites, and the financial institutions that serve them.[34] But the FinCEN leak was unique: rather than exposing financial corruption and international tax crime, it contained thousands of SARs covering nearly two decades of suspicious financial transactions that were reported by banks around the world.

This might have been portrayed as good news, evidence that the public-private cooperation between financial institutions and the US government was working as intended in the fight against money laundering and tax evasion, but the implicit conclusion from the leak was that the system was broken (see Holden, 2020). Although the banks named in the leak complied with the requirement to report suspicious activity, they did not cease their business relationships with suspect clients, moving over $2 trillion in possibly illicit transactions over nearly two decades. In their reporting of the aftermath of the leak, the BBC concluded that "[o]nce a bank has filed a report to the authorities, it is very difficult to prosecute it or its executives, even if it carries on helping with the suspicious activities" (BBC, 2020). And in half of the leaked reports, the banks lacked identifying information about the entities that benefitted from the transactions, in clear violation of "know your client" regulations meant to discourage money laundering in the first place.

[32] *See* Notice and Request for Comments on Proposed Renewal of Information Collections Relating to Reports of Suspicious Transactions, 85 Fed. Reg. 31,598 (May 26, 2020), https://www.govinfo.gov/content/pkg/FR-2020-05-26/pdf/2020-11247.pdf and own analysis (see table 2 panel A at the end of this chapter).
[33] *Ibid.*
[34] *See* Oei and Ring (2018) discussing how, over the past decade, a number of well-publicized data leaks have revealed the secret offshore holdings of high-net-worth individuals and multinational taxpayers.

The leak sparked a debate about the banks' risk-taking incentives and the use of the SAR system to limit the banks' legal risk while continuing to facilitate potentially illegal activities of customers. Short of hard evidence that would require immediate termination of such illicit business, "dirty money" was allowed to freely flow through the global financial world even when the banks had their suspicions. News reporting around the leak reduced the share value of the numerous banks connected with the leak.

Incidents of financial sector misconduct, as well as the inability of regulators to discourage misconduct, can negatively affect confidence in financial institutions. Repercussions in capital markets may in turn serve as an independent constraint on banks' willingness to adopt lax reporting approaches. Therefore, it is important to track the effectiveness of the reporting obligations under the anti-money laundering and counterterrorist financing (AML-CTF) framework.

Regulators have argued that the filing of SARs is crucial to their investigation of potential misconduct and enforcement actions (Schroeder, 2020). However, some scholars have questioned this view, arguing that a high volume of SARs is more consistent with a regulatory regime built on a systemic cost-benefit analysis (Gao et al., 2022). According to this view, banks may over-file SARs because of their desire to avoid penalties and because they continue to engage with customers that have a high potential for financial crime (Takats, 2011; Hock, 2022). Only recently have scholars started to investigate the impact of financial penalties and potential reputational risks for banks likely to develop lax reporting standards. This study considers this the financial penalties hypothesis (see Koster and Pelster, 2017; Huesecken et al., 2018; Nesbitt et al., 2022; O'Donovan et al., 2019).

Whereas articles in the literature have focused on the effect of the disclosure of tax avoidance activities on firm value, little is known about the capital market responses to banks' SAR disclosures and their quality. If the current legal framework of cooperation between FinCEN and the banking industry is insufficient to deter money laundering, as the FinCEN leak suggests, perhaps a market-based response to illicit bank conduct would discourage banks from actions that facilitate financial crimes of their clients. Two opposing views predict the relation between the disclosure of illicit activities and firm value. According to the first view, herein referred to as the information view, the effects of tax or illicit activities disclosure are

positively associated with firm value. Under the information view, the disclosure of the activities associated with the announcement provides information to the markets about the extent of these activities and removes uncertainty that was possibly hurting financial institutions. This view argues that the market reacts positively to public news about a firm's tax information or planning structure. For example, Huesecken et al. (2018) find that the market reacts positively to news about the exposure of multinational firms through the leak of Luxembourg advanced tax rulings. The rationale is that capital markets are more likely to respond positively to the news about a firm's involvement in tax planning activities, particularly for firms with high effective tax rates (ETRs). Alternatively, the second view argues that the announcement of tax avoidance structures has a negative effect on firm value. Significant deviations from the firm's level of tax avoidance are reported to negatively influence firm value. This will herein be referred to as the penalty view. Consistent with this view, O'Donovan et al. (2019) find that firms connected to the use of secret offshore vehicles are more negatively affected, as evidenced by the Panama Papers leak.

To evaluate these two views and their implications for constraining financial and tax corruption in financial institutions, this work investigates the effects of the disclosure of SARs on the capital market valuations of banks. To the extent capital markets respond, it may suggest that these market forces could play a role in compensating for shortcomings of the current legal framework in halting financial and tax corruption. This chapter presents an event study of the short-run impact of the SARs made public as part of the FinCEN leak on banks in the United States. The findings show economically significant negative capital market reaction in the days after the database was made public. These findings are consistent with the penalty hypothesis. The event study also indicates, using wider windows (from five days before until five days after the leak and up to thirty days before until thirty days after the leak), that the negative effects have disappeared from the market.

To further examine the effect of the FinCEN leaks, this work focuses on whether the fines imposed on a bank can have a negative impact on the market valuations. To identify these effects, this analysis documents economically significant negative Cumulative Abnormal Returns (CAR) after the event and in the seven-day window surrounding the event. The analysis documents a significant decrease of firm value in excess of the amount of the fines imposed. However, the event study provides evidence that the negative reaction to the fine

announcement is already eroded in the eleven-day event window [-5, 5]. These findings highlight that there is little information from the leaks that can alter investors' confidence in the long-term value effects of the banks involved.

Next, this work studies how governance characteristics related to the board of directors, executive compensation, ownership characteristics, and third-party rankings of firm governance affect announcements of fines. Given the extensive evidence on the market impact of information leakages on the reputational losses experienced by disciplined firms, it seems reasonable to assume that these fine announcements are anticipated by the market. This analysis evidences that banks and financial institutions with better governance are more likely to have fewer regulatory fines and suffer a smaller financial market effect from the announcements of these fines. To give a concrete example, the results of the analysis indicate a positive relationship between fines and executive compensation, both total compensation and the ratio of variable compensation to total compensation. At the same time, consistent with the insider trading literature, there are fewer instances of advance leakage around fine announcements, suggesting less insider trading and less disclosure of material non-public information for such banks. This result is also dependent on the extent of insider holdings.

This chapter also studies institutional holding characteristics and the relationship with fines incurred and cost of capital. Surprisingly, this relationship has not been explored in the literature until very recently (see Agarwal and Muckley, 2022). In this chapter's analysis of institutional ownership and the risk-taking behavior of banks, the results show that institutional investors diversify holdings away from banks with larger fines. These findings generally support the theoretical argument that the cost of capital is impacted as investors eschew more offending firms.

This chapter contributes to several streams of the literature. These empirical insights can help identify ways to constrain financial institutions from facilitating suspicious and potentially illegal transactions made by their customers. First, these results help to explain the effect of shareholder holdings and governance on the stock market reactions to announcements of financial penalties. Prior works have suggested that weak governance is associated with more enforcement actions, but most of these studies have been limited in scope (see Beasley, 1996; Agrawal and Chadha, 2005). Second, this work contributes to an increasing literature that

measures the extent to which financial penalties affect corporate decisions and investments. Third, the focus on the stock price responses around announcements of regulatory fines allows us to gain a better understanding of the impact of better governance in terms of lower penalties and more muted market reactions to the penalties imposed. Fourth, this work documents that large institutional investors diversify away from more offending firms. Further, the results not only provide evidence on the cost of capital but also contribute to the growing literature on regulatory fines and reputational risks (see Karpoff et al., 2008a, 2008b; Graham et al., 2008; Chava et al., 2018). From an anti-corruption perspective, the goal is then to assess possible implications of these empirical findings for efforts to curb lax reporting standards among financial institutions, which play a quasi-public enforcement role in financial and tax-related legal regimes.

The remainder of this chapter is organized as follows. Section 2 reviews the institutional background of the SARs regime and relevant prior literature. Section 3 describes the data sources and research methodology. Section 4 presents and analyzes the results. Section 5 concludes.

5.2 Background

This section first discusses the institutional background of suspicious activity reporting and relevant prior research. Next, this section describes the multiple datasets used for this study and then presents the empirical method employed for examining how the fines imposed on banks affects the company's abnormal returns, which in turn may create incentives for regulatory compliance and inhibit corruption.

5.2.1 Institutional Background

Money laundering and tax evasion have increasingly challenged regulators around the world (see for example Grasso, 2020). In the United States, Congress, through a number of mechanisms, has developed a legal and regulatory framework to combat money laundering and other federal violations, including tax-driven crimes. Significantly, with the passage of the Bank Secrecy Act of 1970 (BSA)—the core of the regulatory framework—Congress

introduced recordkeeping and reporting requirements for financial institutions and banks. The goal of the legislation is to enlist financial institutions in aiding the federal government's anti-money laundering efforts (31 U.S.C. § 5311 (2021)). The BSA originally required banks to report cash transactions over $5,000, a threshold that increased to $10,000 in 1984. Subsequently, the Money Laundering Control Act of 1986 imposed liability on individuals structuring transactions in order to evade the filing requirements under the BSA. In 1992, landscape of the BSA shifted with the passage of the Annunzio-Whylie Anti-Money Laundering Act which required financial institutions to report suspicious activities (31 U.S.C. § 5318(g)(1)). Two important design features of this legislation are that bank employees receive immunity from legal actions arising from the filing of SARs and that the reports are confidential. Without this feature, the SAR process would likely attract significant opposition from banks and financial institutions regarding an obligation to file meaningful reports of clients' suspicious activity relevant to possible violations of federal law.

Currently under the SAR reporting process, banks and financial institutions are required to file a SAR within thirty days of having detected the suspicious activity and are subject to fines and criminal prosecution for the willful failure to file SARs, which can be filed electronically and may be based on employee suspicions, bank compliance and monitoring programs, or any supervisory investigations. Finally, the Anti-Money Laundering Act of 2020 (AMLA) lifted the cap on the FinCEN Whistleblower Reward Program and increased protections for employees reporting on possible money laundering activities at their financial institution and company (Pub. L. No. 116-283, Div. F, §§ 6001-6003, 134 Stat. 3415 (2021)). These FinCEN Whistleblower reforms introduced significant incentives for bank employees to report violations of the BSA and thereby increase the effectiveness of the enforcement regime in tracking potential offenses. Thus, the BSA enforcement landscape shifted with the passage of AMLA and the increased enforcement of repeat BSA violators under an expanded Whistleblower rewards program.

Although some suggest that the FinCEN enforcement actions have encouraged the beneficial filing of more SARs, the program has been subject to considerable controversy in the empirical literature. As a potential side effect of the immunity provisions, for instance, banks may be encouraged to overreport suspicious activity but continue to work with suspected launderers or tax evaders until the authorities intercede, which may never happen given the

sheer volume of SARs filed annually. Significant volume of SAR filings could result in information overload for the regulators, thereby reducing rather than improving the enforcement benefits.[35] Moreover, to the extent that reporting entities understand the burdens experienced by regulators inundated with disclosures, the reporting entities may pursue a path of over disclosure, with the expectation that it will limit the regulators' ability to detect the serious violations (Blank, 2009). Regardless of the competing explanations, presumably the high cost of regulatory fines and potential for reputational harm may also serve to reinforce the compliance culture within large financial institutions.

5.2.2 Prior Literature

This section introduces the three strands of the literature motivating this analysis: the literature on firm reputation (including both an ex ante perspective focused on risk-taking behavior by firms and an ex post focus on measuring reputational costs incurred by firms); the literature on bank risks and performance (particularly with respect to governance); and the literature on event studies surrounding data leaks, financial fraud, and financial statement reporting.

A large body of empirical literature on the impact of regulatory sanctions has emerged in recent years. Starting with Beneish (1999), a number of papers have looked at the reputational effects and long-term costs associated with financial misreporting. Karpoff et al. (2008a) consider the effects of SEC enforcement actions on firms for fraudulent misreporting on financial statements. Using an event study methodology, they estimate how firms' market value is impacted by such fraudulent misreporting on financial statements. Notably, in estimating losses to the firm as the result of reputational risk, they take into account the size of any financial misreporting as well as the size of the penalties levied in estimating losses to the firm as the result of reputational risk. They find that firms face significant losses in terms of market value beyond the penalty amounts and the magnitude of the financial misstatements; they attribute these losses to decreased future revenues and increased borrowing costs as well as to more stringent bond and loan covenants as a result of the reputational damage caused by the financial misreporting. Armour et al. (2017) document

[35] *See for example* Paredes (2003) discussing the consequences of information overload in securities regulation.

that the announcement of an enforcement process for violations of financial regulations results in reputational losses nearly nine times the size of fines.

Other studies focus on the impact that misreporting can have on borrowing costs. Graham, Li, and Qui consider the effect of both fraudulent and error-related financial statement misreporting on firm borrowing costs in terms of higher spreads, shorter maturities, higher rates of collateralization, and more covenants (Graham et al., 2008). They find that both types of misreporting, fraudulent and non-fraudulent, result in increased borrowing costs, but the impact of fraudulent misreporting is significantly higher. This effect is independent of the channel by which the misreporting is identified and the refiling is initiated. They do not consider governance-related aspects except to note that internally identified and initiated refilings do not impact the increased borrowing costs that result from misreporting; they conjecture that this is evidence of minimal if any governance-related effects. However, their analysis is ex-post (that is, after the misreportings have been identified), and therefore does not preclude the possibility that governance may impact the amount of misreporting ex ante.

Chava et al. (2018) also examine the reputational effects of financial misreporting on firms' borrowing costs, taking into account the duration of these effects, as well as the efficacy of firm efforts to improve reputation and lower borrowing costs in the aftermath of a misreporting. They find that increased loan spreads persist for at least six years after restatement. They also consider several governance changes that firms make after misreporting; while such changes have some positive impact on improving reputational damage, even firms making multiple changes realize only minimal benefits. Their analysis is solely ex post and considers neither the role that better a priori governance can play in mitigating reputational damages, ceteris parabis, nor the role that better a priori governance can play in reducing the occurrence of future events that could damage reputation. Also, Gu et al. (2022) show that Chinese firms involved in corporate lawsuits face reputational costs due to increased borrowing costs in terms of spreads, maturity, ratings, and covenants. Although they consider aspects of the legal and regulatory environment as well as cultural and social aspects by examining firms based in different Chinese provinces, they do not consider the effects of firm-specific governance on reputation costs.

In relation to the spillover effects on the cost of equity, Cao et al. (2015) consider the relationship between firm reputation and cost of equity. Whereas they establish that firms with better reputation rankings enjoy reduced costs of equity financing, their study is not concerned with the drivers of reputation and therefore do not consider the role played by governance in this regard.

Managers linked with financial misrepresentation also suffer reputational damage in the form of reduced future earnings, diminished job prospects, and, in some cases, criminal penalties (Karpoff, 2008b). Higher reputational damages accrue to managers responsible for financial misrepresentations at firms with stronger governance characteristics, including certain ownership characteristics. This line of reasoning demonstrates that managerial and firm incentives can be aligned through better governance when it comes to avoiding reputational damage.

In recent years, a small literature has emerged that focuses on the relationship between fraudulent events and governance and finds some evidence that strong governance reduces the occurrence of firm financial fraud. Beasley (1996) finds that firms with higher percentages of independent directors and longer average director tenures were less likely to be involved in financial fraud. Similarly, Agrawal and Chadha (2005) find evidence that the presence of independent directors and certain audit committee characteristics are correlated with the reduced occurrence of earnings restatements. These studies employed small sample sizes and their focus is limited to investigating specific board of directors and auditor characteristics.

In their analysis of the Panama Papers leak, O'Donovan et al. (2019) estimate reputational damages to firms named as using secretive offshore vehicles. Using an event study, they calculate the impact of the leak on firm value. They found that firms named in the leak suffered a reduction in firm value due to decreased revenues and increased tax-related investigations. They also found evidence of an inverse relationship between governance quality and the financial impact of the leaks. One explanation is that some shareholders had used the offshore vehicles of poorly governed firms to expropriate value, and therefore the leak actually resulted in a stop to such expropriation activities, which led to some increases in firm value.

A related line of literature considers the role of corporate governance in bank failures during the financial crisis. Berger et al. (2016) find that certain characteristics were related to lower probabilities of bank failure during the financial crisis. Peni and Vèahèamaa (2012) find evidence that banks with stronger governance characteristics enjoyed moderately better financial performance at the beginning of the financial crisis and slightly higher financial market returns in the immediate aftermath of the financial crisis. Both of these studies are limited to the years surrounding the financial crisis and do not consider the aspects of governance and firm behavior that would result in regulatory penalties and fines. In the realm of European banks, Migliardo and Forgione (2018) find that certain ownership characteristics have positive effects on banks' profitability and risk profiles. Azar et al. (2022) examine the relationship between bank ownership, competition, and pricing. They find that the common ownership of shareholders across banks in the United States results in decreased competition and increased pricing.

5.3 Research Methodology

This section describes the datasets and methodology and provides an overview of the summary statistics of the datasets.

5.3.1 Data

Although FinCEN provides some descriptive statistics on SAR reports submitted by banks operating in the United States, the data are only very high level and lack any granular detail.[36] However, in September 2020, BuzzFeed News in cooperation with the International Consortium of Investigative Journalists (ICIJ) published several news articles using leaked SAR data (Leopold et al., 2020; ICIJ, 2020). The ICIJ also published a portion of these data showing certain information on a selection of over 18,000 SARs filed by U.S.-based banks from 2004 through 2017.[37] These data contain the names of the originating and destination

[36] *See SAR Stats*, FINCEN, https://www.fincen.gov/reports/sar-stats (last accessed January 2022).
[37] See *Explore the FinCEN Files Data*, ICIJ (2020), https://www.icij.org/investigations/fincen-files/explore-the-fincen-files-data/.

banks as well as the countries of origin and destination, the dates and amounts of the transactions, and the US-based correspondent bank that cleared the transactions.

Table 2 provides some descriptive statistics of the data from the FinCEN leaks as published by the ICIJ along with some of the high-level summary data provided by FinCEN. The FinCEN only provides high-level summary data beginning in 2014. However, as can be seen by comparing the annual summary statistics, the number of SARs covered by the FinCEN data leaks is only a small fraction (less than one percent) of the total SARs filed by financial institutions over this overlapping four-year period (from 2014 through 2017). Without any data on the entire population of SARs from which this sample is drawn, it is impossible to draw any inferences from the information in the SARs from the FinCEN leaks. Furthermore, there is no definitive information about which, if any, of the SARs published due to the FinCEN leaks ultimately resulted in fines. The FinCEN data leaks shed interesting light on the actions of regulators in response to fines. Journalists have used the data to show patterns over time of transactions involving sanctioned individuals and entities (Leopold et al., 2020; ICIJ, 2020; Holden, 2020; BBC, 2020; Schroeder, 2020). Although this perhaps opens banking regulators to scrutiny, it should be of no surprise to banks and of little more than fleeting interest to the market. The FinCEN data leaks are not broad enough to statistically analyze the financial effects on financial institutions or to investigate relationships with other firm variables. Although there may be some very short-term initial shocks to some market participants in seeing the involvement of a specific bank in a fraudulent activities case disclosed in the leaks and the accompanying journalistic coverage, there should not be any significant effects on the market value of banks. Banks have already submitted these SARs to regulators; fines have already been assessed and paid. Similar to other papers examining such data leaks (see for example Koster and Pelster, 2017; Huesecken et al., 2018; Nesbitt et al., 2022; O'Donovan et al., 2019), this chapter introduces further data and analysis in order to fully examine the overall issues.

In order to take a deeper and broader approach to analyzing the involvement of financial services firms in fraudulent activities, this research begins by looking at fines levied against banks and related financial institutions for financial and banking-related offenses. This work also examines the effect of market reactions to the announcement of regulatory fines and related violations as well as the connection with corporate governance and holdings data. To

do so, this analysis employs a dataset consisting of announcement dates of fines, the names of the offending financial institutions, and the corresponding penalty amounts drawn from the Violation Tracker database maintained by the Corporate Research Project.[38] The Violation Tracker dataset contains information on a wide range of fine categories levied on companies by U.S. federal and state authorities on companies.

To compile this dataset using the Violation Tracker database, it is first necessary to screen for any fines imposed on financial industry companies over the 2007–2017 period for financial-related offenses including anti-money-laundering deficiencies, economic sanctions violations, know-your-customer (KYC) deficiencies, and other banking-related violations. This provides the amount of the penalties, the dates they were announced, information on the assessing agency or agencies, and details of the type of offense and the fine being levied. It is then necessary to screen these data for complete records and remove any incomplete records; it is also necessary to combine any entries that include fines levied by different regulators together for the same offense. Summary statistics on the penalties data used in the dataset are shown in Table 3.

It is then necessary to merge this dataset with data from the Bloomberg Financial terminal and from Refinitiv (formerly Thomson Reuters). From Bloomberg, the following data is taken: annual firm-level accounting data, GICS industry group classifications, cost of capital (cost of debt and cost of equity) measures, and securities pricing and market capitalization data for all firms.

5.3.2 Ownership and Governance Characteristics

Corporate governance ratings data, as well as data on executive compensation and board structure, are taken from Bloomberg. Data on insider holdings are also sourced from Bloomberg; specifically, the sum of the percentage of shares held by executives and by non-employee directors is used.

[38] *See Violation Tracker,* GOOD JOBS FIRST, https://www.goodjobsfirst.org/violation-tracker [https://perma.cc/L36W-XYJK] (last accessed January 2022); CORP. RSCH. PROJECT, https://www.corp-research.org/home-page (last accessed January 2022).

Characteristics of institutional investor holdings are calculated from data accessed via summary SEC 13F filings data available through the Refinitiv Database on Institutional Holdings. Investment managers with at least $100 million in assets under management are required to file form 13F with the SEC, listing their equity ownership stakes (17 C.F.R. § 240.13f-1 (2006)). For these calculations, it is necessary to consider the ultimate or beneficial owner of the shares. This way, when an asset manager holds shares in the same company in different funds or managed accounts of the same company, double-counting the number of investors holding the company's shares is avoided and it is ensured that each total holding is attributed to the correct institutional investor.

The data obtained from the forms 13F allow for the calculation of the following firm ownership characteristics: the percentage of shares held by all institutional investors; the percentage of shares held by blockholders (defined as an institutional investor with an ownership position of at least five percent); and the percentage of shares held by the five largest institutional investors.

The following executive compensation data is included in the dataset: the ratio of total executive compensation to total revenues, the ratio of the value of options awarded to all executives to total executive compensation, the ratio of the value of stock awarded to all executives to total executive compensation, the ratio of cash bonuses awarded to all executives to total executive compensation, and the ratio of total variable compensation to total executive compensation.

The following characteristics of firms' boards of directors are included in the data: the percentage of independent directors on the board, the size of the board of directors, the number of board meetings per year, and an average of the percent of members in attendance at each board meeting throughout the year.

In addition to insider and institutional investor holdings data, executive compensation data, and board characteristics, third-party ratings of firm governance published by Bloomberg and Sustainalytics are employed to study the effects of governance.

The Bloomberg governance disclosure score does not purport to measure governance quality; this rating measures only the extent of a company's governance-related data disclosure. It is a Bloomberg proprietary score that ranges from 0.1 for companies that disclose a minimum amount of governance data to 100 for those that disclose every governance-related data point collected by Bloomberg. Bloomberg states that "each data point is weighted in terms of importance" and that "the score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector" (Bloomberg Financial Terminal, accessed June 2021). This score measures the amount of governance data a company reports publicly and does not measure the company's performance on any data point.

The Sustainalytics governance quality ranking is "assigned to the company based on its governance score relative to its industry peers" (Bloomberg Financial Terminal, accessed June 2021). The ranking ranges from 0 for the companies with the poorest governance quality ranking, to 100 for the best. The Sustainalytics governance ranking is the rank of the company's management of its governance activities in relation to industry peers.

Using both the Sustainalytics and Bloomberg governance ratings allows us to have two competing ratings of overall firm governance and to specifically consider firm disclosure of governance data as measured by the Bloomberg rating versus the quality of firm governance as measured by the Sustainalytics rating.

5.3.3 Event Study Methodology

Next, an event study methodology is employed to calculate abnormal returns around announcement dates related to the FinCEN leaks and regulatory fines in the dataset.

An event study is used to estimate the impact of a particular news item or event on a firm's share price. By employing the Capital Asset Pricing Model (CAPM) (see generally Sharpe, 1964; Lintner, 1969), one estimates how each firm's security reacts with general market movements. This is how the security's returns are expected to develop in the absence of any new firm-specific information. The CAPM model calculates expected returns (E(R)) as:
E(R) = Rf+alpha+beta*(Rm-Rf),

where Rf is the risk-free rate, and Rm is the market return.

This then allows for the calculation of daily Abnormal Returns (ARs). These are calculated as the difference between the predicted daily return in relation to general market movements according to the CAPM and the actual security returns. One can express the AR calculation as:

AR=R-E(R),

where R is the actual realized security return and E(R) is the expected security return according to the CAPM model.

Cumulative Abnormal Returns (CARs) can then be calculated for windows of time around the event or release of information (defined as day *t*=0) by summing all daily ARs for that time window. Therefore, for a given event window (day t=*i* to day *t*=*j*), the CAR is therefore calculated as:

$$\text{CAR}= \sum_{n=i}^{j} AR_n.$$

For a dataset of many firm-event date observations, the statistical significance of the mean CAR can be calculated to generalize the reaction of all firms to a single common event (as is the case for the FinCEN leaks) or the reactions of many firms to various individual firm-specific events occurring at different times (as is the case for the penalty announcements in the dataset).

To calculate the terms for the CAPM model for expected return calculations for each security, an estimation window of 100 days, starting 130 days before the event date (day *t*=0) is used. The gap between the estimation window and the day of the event minimizes the likelihood that any estimated returns are impacted by the event itself, by any advance non-public information, or by any market anticipation of, or speculation about, the event. The returns on the S&P 500 index are used for market returns and the yield on the thirty-day U.S. Treasury bill for the risk-free rate. An ordinary least squares (OLS) regression is then used to calculate the terms for the CAPM for each security.

ARs are then calculated for publicly traded financial institutions named in the SARs from the FinCEN leaks using the date of the leaks as t=0. Additionally, ARs for each penalty date in the dataset on penalty events are calculated. The date of the announcement of the fine is t=0. The ARs are summed in order to calculate CARs for various windows of time around the announcement dates to generalize market reactions immediately around the event and over a slightly longer time period. Furthermore, this analysis examines CARs in pre-event and post-event windows in order to analyze any securities price movements occurring prior to the event due to leakage of non-public information pre-announcement date, market anticipation of or speculation of the event, or a combination of both.

From the event study conducted on the events in the fines database, one can study the effect of the penalty announcement on a firm's market value; however, this statistic alone provides limited information beyond the change in security returns (and firm market value) in response to the announcement of a fine. The amount of the fine also needs to also be considered for a more meaningful analysis. Therefore, this analysis considers the amount of the fine in relationship to the firm's pre-announcement market value. By adjusting the CARs by the amount of the fine as a percent of market capitalization, it is then possible to properly assess how the market reacted to the announcement of the fine and gauge any relative over or under-reactions beyond the impact from the value of the fine itself. Karpoff et al. (2008a) make a similar adjustment in calculating the effects on firm value in their event study. The method employed in this analysis calculates adjusted CARs by adding the CAR to the ratio of the announced fine to the firm's market capitalization on the day before the fine was announced (day t=-1).

Any fines levied would erode the market value of the firm by the amount of the fine; and any abnormal market returns in excess of that percentage would indicate that investors are perceiving additional information from the announcement of the fine with regard to reputational losses from decreased revenues, increased borrowing costs, or future related regulatory fines. An excessively negative reaction (that is, an adjusted CAR<0) could be due to investors believing that there are potentially more fines to come, under-anticipating the risk of the fine being assessed, or selling shares because of reputational effects that may result in future value loss to the firm. In the case of institutional investors with stakeholder-

imposed mandates, these institutional investors may be selling shares because of concerns about non-financial reputational impacts of the announced fine.

On the other hand, if there are abnormal returns less than the amount of the fine as a percentage of the market cap before the fine was announced (that is, an adjusted CAR>0), it could indicate that investors are less concerned about the value impact of the fine on the firm. Perhaps they over-estimated the risk of a fine or the amount of the fine ultimately assessed, or they may be largely confident in the ability of the firm's management to mitigate any effects on the long-term value of the firm and do not anticipate any lasting reputational effects on firm value.

By considering pre- and post-announcement windows, it is possible to separately consider investor anticipations leading up to the final announcement of the fine amount and in the days immediately after the fine is announced. The pre-announcement window allows for the consideration of how investors are anticipating the ultimate amount of the fine and whether they are over- or under-estimating the final amount of the fine. Reactions prior to the fine announcement may also be indicative of information being communicated by the firm to investors in the lead-up to the announcement of the fine or leakage of non-public information by firm insiders. Regardless of the specific reasons causing them, significant negative adjusted CARs would indicate that the market is over-punishing the firm, because of unclear information communicated by the firm, trading by insiders, trading due to leaked non-public information, or simply the market estimating the negative reputational costs. In any event, one would similarly expect weaker governance to lead to more significant negative adjusted CARs in both the pre-announcement window and post-announcement windows, albeit for potentially different reasons.

This analysis then adds the adjusted CARs for the pre-announcement and post-announcement windows (respectively t=-3 to t=-1 and t=0 to t=3) for each observation in the penalty dataset where each observation is for a unique firm-penalty date pairing. Table 4 shows univariate statistics for all data variables.

5.3.4 Regressions

This work uses regression analysis to study the effect of the relationship between corporate governance and firm ownership characteristics on the market reaction to penalty announcements and total penalties incurred by firms, as well as to investigate the resulting effects on the cost of capital.

In all the regression models, the following control variables are employed. The natural logarithm of total assets controls for size. The ratio of total debt to total assets is used to control for leverage. Tobin's Q is used to control for levels of intangible assets as it considers the difference between book and market value of the firms. Return on assets (ROA) is used to control for firm profitability. Dummy variables are generated for each four-digit GICS industry group classification (within the GICS financial sector) in order to control for industry group effects, and dummy variables are generated for each year in order to control for year effects. All control variables are lagged by one year in the regressions.

5.3.4.1 Market Reaction Analysis (ex post)

By regressing on the adjusted CARs, it is possible to test to what extent certain governance characteristics are related to market reactions in excess of the amount of the penalties imposed. Karpoff et al. (2008a) use this excess to estimate the reputational losses incurred by firms. Thus, this analysis allows for the examination of which governance characteristics are related to reduced reputational losses from imposed fines. This ex post analysis allows for the testing of whether governance and ownership characteristics can mitigate the value consequences and reputational risks incurred by firms from the imposition of regulatory fines. As the above literature review has discussed, previous authors have found that some aspects of governance can have a mitigating effect on reputational damages (Chava et al., 2018; Karpoff et al., 2008a, 2008b; Beasley, 1996; Agrawal and Chadha, 2005). Therefore, it is expected in this work that less negative (that is, more positive) adjusted CARs would be correlated with better firm governance.

5.3.4.2 Firm Behavior Analysis (ex ante)

This work then examines the relationship between governance and firm behavior by considering the total fines levied against a firm and the firm's governance characteristics. For

these regressions, the dependent variable is the sum of all fines incurred by a firm in a particular year. In order to consider the firm perspective and how firm behavior in incurring fines may be related to corporate governance factors, the amount of the fine is divided by the firm's revenues. This measure of fines scaled by revenues provides a relative perspective of how damaging the fines are to the firm's cash flows. Chava et al. (2018) find that firm improvements in governance made after financial misreporting have little impact on reducing reputational costs. The ex ante perspective employed here examines the role that governance can play in mitigating firms' risk-taking behavior with respect to regulatory risks before fines are imposed. As some of the prior literature finds that better governance can lead to a lower risk of bank failure (Berger et al., 2016) and better financial performance by banks (Peni and Vèahèamaa, 2012; Migliardo and Forgione, 2018; Azar et al., 2022), it is expected that better governance will also lead to less risk-taking by firms and therefore a lower total amount of fines being imposed.

5.3.4.3 Cost of Capital Effects

Finally, this work considers the effect of the penalties on the cost of capital along with the governance and ownership characteristics that the previous analyses found most significant. This way, it is possible to compare the reputational impact of penalties on firm financing costs, along with corporate governance factors. For the cost of capital, Bloomberg-reported estimates of a firm's cost of debt and cost of equity are employed. The cost of debt calculation takes into account the after-tax weighted average spread of a firm's debt securities over long-term (ten-year) government bonds; it is calculated using government bond rates of corresponding maturities, a debt adjustment factor, the proportions of short- and long-term debt-to-total-debt, and the firm's effective tax rate. The cost of equity is derived using the Capital Asset Pricing Model (CAPM) (see generally Sharpe, 1964; Lintner, 1969), which represents the premium over the risk-free rate demanded by equity investors in the firm.

5.4 Results and Analysis

This section discusses the results of this work's analyses in connection with previous literature and the conjectures presented above.

5.4.1 Event Study Results

Table 5 panel A examines the CARs surrounding the FinCEN leaks for several selected event windows. Although the market reaction in the days after the FinCEN leaks (from the day of the leak until three days after the leak), is negative, this observation is tempered when examining the wider seven-day window around the leak (from three days before until three days after the leak). Looking at that window, the mean CAR is not even statistically different from zero. Using even wider windows (from five days before until five days after the leak and up to thirty days before until thirty days after the leak), the event study shows statistically significant positive CARs, indicating that the market value of the banks has more than recovered from any value changes caused by the FinCEN leaks. The fleeting nature of the negative CARs around the release date of the FinCEN leaks and the magnitude of positive mean values of the CARs in the wider windows would further suggest that the market does not anticipate any long-term value consequences from the publication of the FinCEN leaks.

The results of this analysis are in line with expectations that there is little information from the leaks from which investors can infer any long-term value effects on the banks involved. The results are in contrast with those of O'Donovan et al. (2019) finding long-term negative value effects for firms implicated in the Panama Papers leaks. However, the Panama Papers leaks uncovered ongoing and previously secretive actions by some firms to aggressively evade taxes, and sometimes to expropriate value, offer bribes, or engage in other fraudulent or criminal activities. The leaked SARs as part of the FinCEN leak were already filed with regulators, who would already have assessed both the relevant fines related to the activities and the impact of the fines absorbed by the market at the time of the assessments.

Despite media reporting of the FinCEN leaks that highlighted the systemic conduct of the financial institutions and government regulators, and provided insights for observing the failures of both through a lens of financial corruption (as broadly conceived), the banks and other financial institutions nonetheless suffered no negative long-run returns as measured by CARs.

Table 5 panel B shows the adjusted CARs (adjusted by penalty amount as a proportion of market cap on the day before the fine was announced) for the announcement of fines for several selected event windows. Based on the statistical significance of mean adjusted CARs,

there is little evidence of widespread disclosure of new information by firms, little leakage of non-public information by insiders, or both, regarding the regulatory investigation leading up to the penalty announcement before the fine is officially announced. There are statistically significant negative adjusted CARs after the event and in the seven-day window around the event (from three days before until three days after the fine announcement). Importantly, this shows that there is a statistically significant decrease in firm value in excess of the amount of the fines imposed. However, by the eleven-day window (from five days before until five days after the day of the fine announcement), this effect is already eroded and is statistically similar to zero. One possible interpretation of this finding is that negative market reaction over a short time window indicates that the market quickly comprehends the new information of regulatory sanctions risk.

5.4.2 Regression Results

The event study of the penalty announcements is informative of the average reaction of firms to penalties and shows with statistical significance the reputational costs firms incur in addition to the announcement of the fines. Thus, while prior literature has studied the impact of regulatory sanctions on banks, this paper goes further and examines how individual firms' governance characteristics are related to the magnitude of the reaction beyond the penalty amounts imposed. This study regresses the governance characteristics onto the adjusted CARs, taking into account governance characteristics related to board of directors, executive compensation, and ownership characteristics, as well as third-party rankings of firm governance.

5.4.2.1 Board Characteristics

The results indicate that firms with higher percentages of independent directors incur lower fines overall. This is consistent with the view that risk-taking behavior by management can be mitigated through the presence of independent directors, as has been evidenced in studies by Beasley (1996), Agrawal and Chadha (2005) (when independent directors bring additional expertise) and by de Andreas and Vallelado (2008) (as long as boards are not excessively large).

This study also finds that higher percentages of independent directors are correlated with more negative pre-announcement adjusted CARs—a result potentially indicative of insider trading and the leakage of information and the resulting trading on non-public information, or a combination of both. This result is consistent with the findings of Ravina and Sapienza (2010) that independent directors often sell stock prior to official announcements of news that negatively affects firm share prices.

There is a negative relationship between CEO duality and fines: firms in which the CEO and chairman of the board positions are occupied by the same individual have lower fines. Moreover, CEO duality is correlated with more negative adjusted CARs after fine announcements. The beneficial and negative impacts of CEO duality in the results are consistent with the prior literature.

Although there is conflicting evidence regarding whether CEO duality has a beneficial or harmful effect on firm performance (see generally Adams et al., 2010), Berger et al. (2016) find that CEO duality lowers the probability of bank failure. They conjecture that this may be due to increased exposure to reputational damage when the same individual occupies two of the most powerful and visible positions in the company. The findings of Karpoff et al. (2008b) show that, along with firms, managers suffer personal reputational costs in terms of diminished job prospects and reduced future earnings potential. This is particularly the case for more senior managers and board chairs; combining those two roles would mean that the individual would likely bear an even greater reputational effect if the firm were fined. This effect is likely amplified for executives in the financial services sector. The financial crisis of 2007–2008 brought the failures of financial institutions into the spotlight and resulted in even greater stigma from being attached to such failures.

The finding on CEO duality indicate that this feature leads to fewer fines ex ante, as these CEO-chairmen are more cognizant of the increased reputational risks they personally face. Ex post, the results indicate that firms with CEO duality suffer greater reputational damage, as they are punished more severely by markets after the announcement of a fine. Consistent with this result is the observation that this outcome would be particularly notable in the case of firms with a joint CEO and board chairman.

5.4.2.2 Compensation Characteristics

The analysis with respect to compensation characteristics shows a positive relationship between fines and executive compensation, both total compensation and the ratio of variable compensation to total compensation. There is also a positive relationship between executive compensation and adjusted CARs after the announcements of fines, indicating that higher compensation may have a slight mitigating effect on market reactions in the wake of fine announcements.

The literature supports the conjecture and findings that higher compensation results in greater risk-seeking behavior and more fines. Banks and other financial institutions are highly leveraged, and managerial incentives are, therefore, more aligned with common shareholders and less so with debtholders, meaning that less attention is given to downside risks (see Bebchuk and Spamann, 2010). This situation is obviously intensified when there is a greater component of variable compensation. These results are consistent with the analyses of executive compensation at banks by Fahlenbrach and Stulz (2011) as well as Berger et al., (2016). Though their analyses considered the compensation of different levels of executives (which offers a more nuanced picture), the results of this study are consistent with their overall conclusions.

With regard to the positive relationship between executive compensation levels and adjusted CARs after fines are announced, consider the results of Karpoff et al. (2008b), which demonstrate the negative personal reputational costs (in terms of diminished future employment prospects and earnings potential) that accrue to managers when firms misreport financial statements. The results of the analysis of compensation characteristics can be interpreted as showing two competing effects: higher compensation results in increased incentives for risk-taking behavior ex ante, but personal reputational costs motivate executives to mitigate the fallout from the imposition of regulatory penalties ex post. The results suggest that this motivation increases with compensation levels since higher paid executives have more to lose (in terms of the present discounted value of future earnings) when risky behavior is identified and punished by regulators.

5.4.2.3 Ownership Characteristics

The first set of results find that higher holdings by firm insiders are associated with statistically significant more negative adjusted CARs in the pre-announcement windows of fines. This is indicative of insider trading, leakage of non-public information, or a combination of both. This result is consistent with the literature on insider trading, such as the results of Summers and Sweeny (1998) evidencing insider trading activity amid misstated financial statements and Ravina and Sapienza's (2010) demonstration of insider trading by directors before negative company announcements. Taking the results, more broadly, as general evidence of poor governance, this would be consistent with findings by McConnell and Servaes (1990), who show that as insider holdings increase, firm value declines; and by Berger et al. (2016), who show that higher shareholdings of insiders increase the likelihood of bank failure.

With respect to institutional ownership characteristics and ex ante risk-seeking firm behavior, consider two competing hypotheses. On the one hand, investors with large holdings have incentives to actively monitor firm behavior and the means through increased voting power, to ensure that firms avoid excessive risk taking. On the other hand, large institutional investors may assume a more passive role in part because of monitoring costs and the free-rider problem that creates a failure of collective action. Similarly, when considering the influence of ownership concentration and large blockholders, there are also two competing effects. Concentrated ownership can result in blockholders using their influence to pursue private benefits to the detriment of total firm value; however, high ownership concentration can lead to more efficient monitoring which can benefit all shareholders, not just blockholders (see generally Barclay and Holderness, 1989; Shleifer and Vishny, 1986; Black, 1990; Karpoff et al., 1996; Agrawal and Knoeber, 1996; Huddart, 1993; Maug, 1998).

Particularly in the case of financial institutions, Erkens et al. (2012) argue that with more concentrated shareholders, the interests of common shareholders and managers are more closely aligned. This results in higher-risk behaviors as shareholders and managers do not internalize the social costs of bank failure and, therefore, overly discount the downside risk of risky strategies. They find that higher institutional ownership was associated with greater risk taking behavior immediately prior to the financial crisis of 2007–2008. However their study focuses on the risk of bank failure during an exceptional period: 2007–08. More broadly

speaking, the evidence seems to support the conjecture that higher institutional ownership has a positive effect on the risk-return profile of firms (see for example McConnell and Servaes, 1990; Gillan and Starks, 2000). Additionally, newer studies focusing on the banking sector after the financial crisis of 2007–2008, such as Azar et al. (2022) as well as Migliardo and Forgione (2018), find that concentrated ownership and large levels of institutional investors lead to improved performance metrics. Consider, also, that due to extensive common ownership among larger institutional investors across the U.S. banking sector—a trend that has continued to increase notably since the financial crisis of 2007–2008—competition among financial institutions has decreased, resulting in increased profitability and, therefore, less pressure on individual firms to seek out riskier strategies to improve profitability (Azar et al., 2022).

To support the positive benefits of institutional ownership, the combined regression models demonstrate that, controlling for the same level of ownership among the top five largest investors, there is a positive relationship between blockholders and fines. There is a negative relationship between blockholders and fines only when the holdings of blockholders are regressed alone (that is, without holding overall ownership of the top five largest institutional investors constant). This is because of the strong effect at the large end when the top five shareholders are increasing their ownership stake. This supports the idea that an increase in blockholders, holding the combined ownership of the top five constant, leads to riskier behavior. It is only when very large investors have larger stakes (that is, the holdings of the top five increases), while controlling for constant levels of blockholders, that firms start to adopt less risky behavior; thus, the increased presence of very large institutional investors reins in the risk-seeking motives of average blockholders. This illustrates the overriding influence from the very largest institutional investors. This influence likely occurs because of a combination of the decreased competition that comes with common ownership, the presence of a strong voice to shape managerial behavior, and reputational concerns (Fichtner et al., 2017). The reason for the latter is that these large investors would disproportionately face a reputational cost due to excessive risk-taking, particularly in the financial services sector after the financial crisis resulted in greater stigma being attached to bank failures. The ex ante analyses on penalties accrued by firms nicely illustrate the competing effects and demonstrate that one competing hypothesis wins out over the other depending on how significant the influence is from the very largest institutional investors.

The ex post analysis similarly shows that greater holdings by institutional investors generally, and among the five largest in particular, provide a stabilizing effect: negative adjusted CARs after the announcement of fines are decreased resulting in less market reaction beyond the dollar value of the fine. This result can be explained by the fact that a larger percentage of outstanding shares are held by a few large institutional investors who are less likely to exercise exit, meaning a lower volume of shares overall are available to be traded, thus tempering any negative price movements (Fichtner et al., 2017). The market is, perhaps, also cognizant of the positive reputation of these firms to engage in less risky behavior and accrue fewer total fines. This means that the large firms' institutional investors, through their strong influence on management (that is, voice channels), are motivated to mitigate any long term reputational damages from the levied fines (Fichtner et al., 2017). However, given a constant level of holdings among the five largest investors, firms with larger blockholdings overall are punished more severely by the market with more negatively-adjusted CARs after the announcement of fines by decreases in market value beyond the dollar value of the fines. Thus, the presence of larger blockholdings outside of the five largest institutional investors is consistent with the view that such smaller blockholders are more likely to exercise exit and sell shares in reaction to negative news. This also mirrors the ex ante relationship between blockholders and risk-seeking behavior.

5.4.2.4 Governance Rankings

The results on using third-party governance rankings confirm the findings that better governance is associated ex ante with less risky firm behavior as measured by lower fines and ex post with less extreme market reactions to the announcement of fines.

This part of the analysis has a parallel in the approach taken by Peni and Vèahèamaa (2012) who used the Gov-Score governance index to test the relationship between bank governance and financial performance during the financial crisis of 2007–2008. However, the present analysis uses two third-party ratings popular with professional investors: Sustainalytics and Bloomberg. Ultimately, the results are not inconsistent with those of Peni and Vèahèamaa (2012). Although they found some evidence that governance was negatively related to

performance during the crisis, banks with better governance performed better immediately prior to the crisis and recovered more quickly from the financial crisis.

Again, it is important to note that the Bloomberg rating is not meant to be a ranking of governance quality but rather the extent of disclosure of governance-related data. Nevertheless, it has a statistically significant relationship to a smaller amount of fines in the ex ante analysis of total firm fines and a more muted market reaction in the ex post analysis of adjusted CARs after the announcement of fines. The evidence in this section highlights the importance of disclosure allowing markets to monitor firm behavior and punish transgressions. Thus, it is important to recognize that markets play a vital role in the cultivation and maintenance of reputation and trust between economic actors—a crucial part of the *Trust Triangle* of Dupont and Karpoff (2020).

5.4.2.5 Cost of Capital Analysis

Finally, this study considers the effects of fines and governance on costs of capital. The analysis examines the most statistically significant governance variables from the prior analyses and examines the resulting relationship with firms' cost of debt and firms' cost of equity. The results are consistent with the relationships found in the previous analysis: firms with better governance enjoy lower costs of capital even with the same level of fines. This applies to both cost of debt and cost of equity. The results are more significant on cost of debt, where the results indicate that penalties are a strong predictor of higher cost of debt and that better governance can help to mitigate this impact. These results are consistent with the findings of Graham et al. (2008), Chava et al. (2018), and Gu et al. (2022) with respect to cost of debt. Although not as large in magnitude or as statistically significant, an important finding of this study shows the beneficial impact of governance on cost of equity (in addition to cost of debt) when controlling for the level of fines.

5.5 Conclusion

Due to the combined effect of deregulation and self-regulation, financial institutions have acquired the role of enforcement partners with the U.S. government in the financial regulatory system. To the extent these institutions are motivated to engage in risk-taking and

noncompliance (and accordingly, fiscal corruption), the viability of this regulatory structure is compromised. This empirical study of how various factors can shape financial institutions' compliance and how penalties may impact compliance decisions suggests that curbing fiscal corruption by these quasi-governmental actors remains a complex and challenging mission.

This chapter examines how governance can mitigate market reactions and reputational costs incurred by firms and explores the effects of governance on the risk-taking behavior of financial institutions. The analysis provides evidence on the market reaction to the FinCEN leaks and the announcement of regulatory penalties for financial and banking-related offenses. Then, regressions are made on the abnormal returns in order to examine the mitigating effect governance has on a firm's market reaction to the fine announcements. In order to match this ex post analysis, a further analysis considers the ex ante influence of governance on a firm's risk-taking behavior, as measured by the total annual fines levied against the firm. Finally, the impact of fines on a firm's cost of capital is analyzed while also considering the mitigating role of governance.

This chapter contributes to the growing literature on the reputational effects of penalties by more closely examining the relationship to corporate governance and ownership characteristics in order to determine whether governance can lessen the market reactions and reputational losses that firms suffer. The prior literature has largely focused on examining ex post effects of fines on reputational costs and increased financing costs. This chapter expands on this literature by also considering the ex ante relationship with governance and ownership to examine the extent to which corporate governance might discourage risk-taking behavior in regard to regulatory risk and might help to foster a more cognizant and cautious environment within firms which is more cognizant and cautious with respect to regulatory requirements. Finally, this chapter extends the analysis by explicitly considering effects on both cost of capital and cost of debt.

Similarly, this work contributes to the banking literature, which has previously focused on the financial and corporate governance drivers of bank failures and bank financial performance. To determine the effect of corporate governance and ownership characteristics on firm behavior, imposed penalties and the reputational impacts via the market reaction to fines for financial related offenses and the connection with firm cost of capital are analyzed. In this

respect, this work complements the literature by using both ex ante and ex post perspectives. Furthermore, the dataset used is focused on the period after the financial crisis of 2007–2008, which is important due to the changing dynamics of the banking sector. Large institutional investors have increased their holdings significantly since 2008 (Fichtner et al., 2017). This has resulted in significant common ownership, with a small subset of very large institutional investors controlling large shareholdings across many industries. Azar et al. (2022) have found that this trend has resulted in decreased competition in the U.S. banking sector. Additionally, the financial crisis of 2007–2008 put risk-taking by financial institutions in the spotlight and therefore attached greater reputational risk to large institutional investors in financial institutions involved in excessive risk-taking. This work is, in this regard, an update as well as an extension of the earlier bank literature examining corporate governance of banks.

In all, this study also helps to uncover important aspects of what Dupont and Karpoff (2020) refer to as the *Trust Triangle*, which illustrates how in addition to legal and regulatory frameworks and cultural norms and values, markets also play a significant role in cultivating trust in economic activities. The market does this by punishing economic actors who violate trust and rewarding those with positive reputations. This study illustrates how market reactions punish firms more when they have poor governance and how firms with good governance promote more trust in economic transactions. Such market-oriented mechanisms are a hallmark of the *Trust Triangle*, as they work together with regulations and culture to facilitate an environment of trust in economic transactions.

5.6 Tables

Table 1—Variable Definitions

This table provides definitions of the variables used in the data analyses.

Variable	Definition
institutional_holdings	This is the percentage of a company's shares which are owned by institutional investors. Institutional holdings data is sourced from the Refinitiv (formerly Thomson-Reuters) Institutional Holdings database and are drawn from 13F filings with the SEC. Any asset manager with at least USD 100 million in assets under management is required to disclose the securities it manages in 13F filings with the SEC.
blockhldrs_holdings	This is the percentage of a company's shares held by institutional blockholders (that is institutional investors with at least a 5% ownership stake). Institutional holdings data are calculated from data sourced from the Refinitiv Institutional Holdings database which draws from 13F filings with the SEC.
top5_holdings	This is the percentage of a company's shares held by the five largest institutional investors combined. Institutional holdings data are calculated from data sourced from Refinitiv, which draws from 13F filings with the SEC.
insider_holdings	This variable is used to measure the shareholdings of insiders. Specifically, it is the shares held by executives and non-employee directors. This corresponds to the sum of the Bloomberg fields: ("SHS_HLD_BY_N_EMP_DIR_AS_%_OF_OUT" + "SHS_HLD_BY_EXECS_AS_%_OF_OUTSTDG")/100
log(assets)	The natural logarithm of a company's assets is used in order to control for relative size in the analyses. This corresponds to the natural logarithm of the Bloomberg field "BS_TOT_ASSET".
CEO duality	This is a dummy variable that indicates whether the company's Chief Executive Officer is also Chairman of the Board. Bloomberg field: "CEO_DUALITY"
log(board meetings per year)	This field is calculated as the natural logarithm of the total number of corporate board meetings held in the past year. This is calculated by taking the natural logarithm of the Bloomberg field "BOARD_MEETINGS_PER_YR"
log(board_size)	This variable is the natural logarithm of the number of full-time directors on the company's board. It is calculated by taking the natural logarithm of the Bloomberg field "BOARD_SIZE"
Board meetings attendance	This is the average ratio of board members in attendance at board meetings during the year. It corresponds to the Bloomberg field "BOARD_MEETING_ATTENDANCE_PCT" divided by 100 for ease of comparison in regression results.

% independent directors	This is the percentage of total directors who are identified as independent. It is calculated as the quotient of the Bloomberg fields “INDEPENDENT_DIRECTORS” / “BOARD_SIZE”.
Total exec comp to revenues	This field is the ratio of the total value of all types of compensation paid to company executives to firm revenues. It is calculated as the quotient of the Bloomberg fields “TOT_COMPENSATION_AW_TO_EXECS” / “SALES_REV_TURN”.
Percent options comp	This is the ratio of the total value of options compensation awarded to executives to the total value of all compensation paid to executives. It is calculated as the quotient of the Bloomberg fields “TOT_OPTION_AWARDS_GIVEN_TO_EXECS” / “TOT_COMPENSATION_AW_TO_EXECS”
Percent stock comp	This is the ratio of the total value of stock compensation awarded to executives to the total value of all compensation paid to executives. It is calculated as the quotient of the Bloomberg fields “TOT_STK_AWARDS_GIVEN_TO_EXECS” / “TOT_COMPENSATION_AW_TO_EXECS”
Percent cash bonuses	This is the ratio of the cash bonuses paid to executives to the total value of all compensation paid to executives. It is calculated as the quotient of the Bloomberg fields “TOTAL_BONUSES_PAID_TO_EXECUTIVES” / “TOT_COMPENSATION_AW_TO_EXECS”
Percent total variable comp	This is the ratio of all forms of variable compensation to the total value of all compensation paid to executives. It is calculated using the sum of the Bloomberg fields (“TOTAL_BONUSES_PAID_TO_EXECUTIVES” + “TOT_STK_AWARDS_GIVEN_TO_EXECS” + “TOT_OPTION_AWARDS_GIVEN_TO_EXECS”) divided by “TOT_COMPENSATION_AW_TO_EXECS”.
ROA	As a control variable for company profitability, return on total assets is used. ROA is calculated as: (Trailing 12M Net Income / Average Total Assets). Bloomberg field: "RETURN_ON_ASSET"
adjusted (-3) to (-1) CARs	This is the cumulative abnormal returns (CAR) on the firm’s shares for the window from three days before until the day before a penalty announcement. It is then adjusted by adding the value of the fine divided by the firm’s market capitalization from the day before the penalty announcement. Penalties data are sourced from the Violation Tracker database maintained by the Corporate Research Project. Data on market capitalization are sourced from the Bloomberg filed: “HISTORICAL_MARKET_CAP”.
adjusted (0) to (3) CARs	This is the cumulative abnormal returns (CAR) on the firm’s shares for the window from the day of a penalty announcement until three days after the penalty announcement. It is then adjusted by adding the value of the fine divided by the firm’s market capitalization from the day before the penalty announcement. Penalties data is sourced from the Violation Tracker database maintained by the Corporate Research Project. Data on market capitalization is sourced from the Bloomberg filed: “HISTORICAL_MARKET_CAP”.

Tier1_cap_ratio	This variable represents the ratio of Tier 1 capital to risk-weighted assets. Bloomberg field: “BS_TIER1_CAP_RATIO”.
NPL_to_total Loans	This is the ratio of gross nonperforming loans, which are loans in default or close to default and do not accrue interest, to Total Loans, which includes commercial loans, consumer loans and other loans. This corresponds to the quotient of the Bloomberg fields: “BS_NON_PERFORM_LOANS”/“BS_TOT_LOAN”
Bloomberg_score	This is a proprietary Bloomberg score based on the extent of a company's governance-related disclosures as part of ESG data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data related to governance to 100 for those that disclose every data point collected by Bloomberg related to the governance component of ESG. Bloomberg tailors the score to particular industries. In this way, each company is only evaluated in terms of the data that are relevant to its industry sector. This score measures the amount of governance data a company reports publicly and does not measure the company's performance on any data point. For ease of comparison in the regressions, this score is divided by 100. This corresponds to the quotient of the Bloomberg field: "GOVNCE_DISCLOSURE_SCORE" /100.
Sustainalytics_score	Sustainalytics assigns a rank for the company's management of its governance activities in relation to industry peers. Scores range from 0 to 100. For ease of comparison in the regressions, this score is divided by 100. This corresponds to the quotient of the Bloomberg field: "SUSTAINALYTICS_GOVERNANCE_PCT"/100.
Tobins Q	Tobin's Q is used to control for the level of a firm's intangible assets. It is the ratio of the market value of a firm to the replacement cost of the firm's assets. The ratio is computed by Bloomberg as: (Market Cap + Total Liabilities + Preferred Equity + Minority Interest) / Total Assets. Bloomberg field: "TOBIN_Q_RATIO"
Leverage	In order to control for leverage, the ratio of firm debt to total assets is calculated. This corresponds to the quotient of the Bloomberg fields "SHORT_AND_LONG_TERM_DEBT" / "BS_TOT_ASSET".
penalties_to_revenues	This field represents the sum of all penalties levied during the year divided by gross revenues from all operating activities. Penalties data are sourced from the Violation Tracker database maintained by the Corporate Research Project. The value for revenues is sourced from the Bloomberg field: “SALES_REV_TURN”.
Industry	In the regressions, industry group dummy variables based on the four-digit GICS industry group codes are used. Bloomberg field: “GICS_INDUSTRY_GROUP”.
cost of debt	This field is sourced directly from Bloomberg. It measures the after-tax weighted average cost of debt for the firm’s debt securities as a spread over the risk free rate (the country's long-term bond rate (10-year)); it is calculated using government bond rates of corresponding maturities, a debt adjustment factor, the proportions of short and long term debt to total debt, and the firm’s effective tax rate. It corresponds to the Bloomberg field: “WACC_COST_DEBT”

cost of equity	This field is sourced directly from Bloomberg. It represents the return over the risk-free rate demanded by equity investors in the firm. It is derived using the Capital Asset Pricing Model (CAPM). The value for the risk-free rate is the country's long-term bond rate (10-year). It corresponds to the Bloomberg field: “WACC_COST_EQUITY”

Table 2—Summary Statistics of SAR Data

This table reports summary statistics of SAR data. Panel A shows aggregate yearly SAR volume published by FinCEN. Panel B presents summary statistics on the SARs released by the ICIJ as part of the FinCEN leaks.

A. Summary SARs data published by FinCEN

Year	Total SAR filings submitted to FinCEN
2014	3,831,748
2015	4,100,105
2016	4,550,538
2017	4,477,514
2018	4,579,794
2019	4,942,512
2020	5,576,559
2021	6,985,542

B. Summary statistics of SARs released by ICIJ as part of the FinCEN leaks

Year	Number of SARs released by FinCEN leaks	total USD of transactions covered by SARs	average USD transaction size per SAR
2004	174	54,297,238	312,053
2005	31	29,211,844	942,318
2006	29	91,271,500	3,147,293
2007	646	1,430,334,818	2,214,141
2008	754	1,468,190,273	1,947,202
2009	354	218,842,377	618,199
2010	533	1,937,899,624	3,635,834
2011	1239	4,271,989,095	3,447,933
2012	2396	2,566,323,116	1,071,086
2013	4495	7,875,959,970	1,752,160
2014	3159	6,245,142,289	1,976,936
2015	2511	3,747,015,623	1,492,240
2016	1827	5,317,998,335	2,910,782
2017	92	420,797,312	4,573,884

Table 3—Summary Statistics of Regulatory Penalties Data

This table shows summary statistics of the regulatory fines in the dataset broken-down by year.

year	total amount of fines (in USD millions)	number of fines	average size per fine (in USD millions)	Average size of penalty as a percentage of market capitalization
2007	262.72	29	9.06	0.08%
2008	21,168.00	31	682.84	1.04%
2009	3,285.15	50	65.70	0.26%
2010	5,914.94	44	134.43	0.58%
2011	4,317.70	41	105.31	0.22%
2012	28,650.94	50	573.02	1.85%
2013	37,231.50	58	641.92	1.00%
2014	41,553.70	57	729.01	0.60%
2015	3,309.35	77	42.98	0.17%
2016	9,641.84	54	178.55	0.42%
2017	1,173.19	46	25.50	1.20%

Table 4—Univariate Statistics for All Variables

This table presents univariate statistics for all variables used in the analyses with the exception of year and industry dummy variables (n=537 observations).

Variable	Mean	Minimum	Maximum	Std. Dev.
Bloomberg_score	0.6092	0.3036	0.8750	0.1060
Sustainalytics_score	0.4902	0.1166	0.9749	0.1903
institutional_holdings	0.6810	0.0001	0.9935	0.1719
blockhldrs_holdings	0.1253	0.0000	0.4691	0.1099
top5_holdings	0.2417	0.0001	0.5036	0.0817
insider_holdings	0.0099	0.0000	0.2366	0.0238
log(board_size)	2.5208	1.3863	3.0445	0.2318
% independent directors	0.8397	0.3750	0.9412	0.1018
log(board meetings per year)	2.4572	1.3863	3.5264	0.4585
Board meetings attendance	0.7839	0.7400	1.0000	0.0758
CEO duality	0.6673	0.0000	1.0000	0.4716
Total exec comp to revenues	0.0121	0.0007	0.0313	0.1154
Percent stock comp	0.5067	0.0000	0.8009	0.1570
Percent options comp	0.0171	0.0000	0.3182	0.0458
Percent total variable comp	0.6893	0.0557	0.9547	0.2217
Percent cash bonuses	0.1655	0.0000	0.7095	0.1573
adjusted (-3) to (-1) CARs	-0.0004	-0.2510	0.2200	0.0375
adjusted (0) to (3) CARs	-0.0047	-0.4040	0.1200	0.0427
cost of debt	2.0266	0.3214	5.2789	0.8943
cost of equity	12.1230	8.2514	18.8280	2.4187
penalties_to_revenues	0.0147	0.0000	0.0936	0.0400
log(assets)	12.2980	5.8256	14.7610	2.3539
ROA	0.0115	-0.0067	0.0410	0.0284
Tobins Q	1.1013	0.9460	1.5640	0.4274
leverage	0.2732	0.0000	0.6134	0.1781
Tier1_cap_ratio	0.1367	0.0831	0.2060	0.0684
NPL_to_total Loans	0.0162	0.0000	0.0377	0.0145

Table 5—Cumulative Abnormal Return (CARs) Statistics

This table presents summary statistics of the CARs from the FinCEN SARs leaks (Panel A) and bank fine announcements (Panel B) for selected event windows. The CARs from the bank fine announcements (Panel B) are adjusted for the size of the fine as a percent of pre-event market capitalization. Column 1 provides the mean CAR for all firms; column 2 reports the t-statistic of the test of the null hypothesis that the mean CAR is equal to zero; column 3 displays the median CAR; column 4 shows the proportion of CARs less than zero; and column 5 shows the results of the nonparametric Wilcoxon signed-ranks test of the proportion of CARs less than zero being equal to 0.50. Statistical significance is denoted at the *10%, **5%, and ***1% levels.

Panel A. FinCEN Leaks CARs

event window	mean CAR	t-statistic	median CAR	proportion negative CARs	sign test
	1	2	3	4	5
[-30, 30]	0.201379***	10.23	0.188790	0.09***	-5.99
[-10, 10]	0.040379***	3.68	0.046343	0.29***	-2.99
[-5, 5]	-0.020698***	-2.66	-0.010431	0.65**	2.18
[-3, 3]	-0.002832	-0.50	0.011481	0.35**	-2.17
[-1, 1]	-0.038521***	-7.75	-0.036096	0.91***	5.99
[-3, -1]	0.027722***	7.51	0.028071	0.11***	-5.72
[0, 1]	-0.042977***	-9.29	-0.046613	0.94***	6.53
[0, 3]	-0.024890***	-5.80	-0.026266	0.79***	4.35
[0, 5]	-0.026070***	-4.70	-0.026280	0.81***	4.62
[0, 10]	-0.002965	-0.40	0.009039	0.43	-1.08
[0, 30]	0.123774***	8.45	0.115520	0.12***	-5.44

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Panel B. Financial Fines adj. CARs

event window	mean adj. CAR	t-statistic	median adj. CAR	proportion negative adj. CARs	sign test
	1	2	3	4	5
[-30, 30]	0.009276	0.92	0.005336	0.48	-0.85
[-10, 10]	0.002230	0.42	-0.003691	0.53	1.19
[-5, 5]	0.003199	0.87	0.000858	0.49	-0.34
[-3, 3]	-0.005058**	-2.11	-0.00125	0.51	0.91
[-1, 1]	0.006857**	2.73	0.002685	0.46*	-1.87
[-3, -1]	-0.000400	-0.25	-0.000793	0.52	1.08
[0, 1]	0.007349***	3.39	0.00127	0.51	0.76
[0, 3]	-0.004657***	-2.51	-0.00207	0.54**	2.04
[0, 5]	0.005599**	2.07	0.003216	0.45*	-1.95
[0, 10]	-0.001562	-0.50	0.000823	0.49	-0.34
[0, 30]	0.011385*	1.86	0.006252	0.46*	-1.87

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 6—Accounting data and CARs

This table reports the results of regressions exclusively of accounting data on the adjusted Cumulative Abnormal Returns ("CARs") before (Panel A) and after (Panel B) the announcement of a fine. The CARs are adjusted by adding the amount of the fine as a proportion of the firm's market capitalization on the day prior to the announcement of the fine (day t=-1). The dependent variable in Panel A is the adjusted CARs for the pre-announcement window (day t=-3 to day t=-1), and the dependent variable in Panel B is the adjusted CARs for the post-announcement window (day t=0 to day t=3). Model 1 includes only the accounting variables used as controls in all other regressions on CARs in subsequent tables. Model 2 repeats this regression for the subset of companies for which data on the firm's tier one capital ratio and ratio of non-performing loans to total loans are available. Models 3–5 show the results of regressions including: only the tier one capital ratio (Model 3); only the ratio of non-performing loans to total loans (Model 4); and both the tier one capital ratio and ratio of non-performing loans to total loans (Model 5). All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

A. Dependent variable: adjusted (-3) to (-1) CARs

	1	2	3	4	5
const	0.031143	0.027073	0.005114	0.031279	0.01718
	(0.020387)	(0.041102)	(0.035827)	(0.041179)	(0.039946)
log(assets)	-0.002703**	-0.003476**	-0.002649	-0.002592	-0.002806
	(0.001110)	(0.001683)	(0.001714)	(0.001810)	(0.001921)
leverage	0.030601**	0.041515	0.013871	0.020585	0.0239
	(0.013768)	(0.025786)	(0.025207)	(0.030242)	(0.033775)
ROA	-0.197258*	-0.742241**	-0.670648**	-0.607948*	-0.486976
	(0.108336)	(0.341099)	(0.320198)	(0.355566)	(0.357460)
Tobins Q	0.009753	0.013168	0.018277	0.000932	0.010124
	(0.008197)	(0.029972)	(0.029990)	(0.031340)	(0.034358)
Tier1_cap_ratio			-0.00468		-0.027281
			(0.053003)		(0.079055)
NPL_to_total Loans				0.414523	0.858689**
				(0.313860)	(0.399770)
year effects	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes
n	537	348	348	348	348
Adj. R2	0.028052	0.08644	0.03617	0.047301	0.037244

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

B. Dependent variable: adjusted (0) to (3) CARs

	1	2	3	4	5
const	-0.036090*	-0.086006*	-0.099300**	-0.093336**	-0.098620**
	(0.021663)	(0.046988)	(0.043285)	(0.046912)	(0.048098)
log(assets)	-0.002789**	0.004148**	0.004238**	0.002607	0.004114*
	(0.001273)	(0.001924)	(0.002071)	(0.002062)	(0.002313)
leverage	0.000645	-0.00183	-0.016677	0.034644	0.004795
	(0.014629)	(0.029479)	(0.030455)	(0.034452)	(0.040668)
ROA	-0.254900**	-0.502765	-0.58767	-0.736800*	-0.879172**
	(0.124279)	(0.389944)	(0.386856)	(0.405063)	(0.430413)
Tobins Q	0.000223	0.047374	0.052608	0.068698*	0.051725
	(0.008711)	(0.034264)	(0.036234)	(0.035702)	(0.041370)
Tier1_cap_ratio			0.011555		0.06525
			(0.064038)		(0.095189)
NPL_to_total Loans				-0.722394**	-1.248265***
				(0.357550)	(0.481357)
year effects	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes
n	537	348	348	348	348
Adj. R2	0.020667	0.050764	0.007279	0.017002	0.022938

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 7—Ownership Characteristics and CARs

This table reports the results of regressions of firm ownership characteristics on the adjusted Cumulative Abnormal Returns ("CARs") before (Panel A) and after (Panel B) the announcement of a fine. The CARs are adjusted by adding the amount of the fine as a proportion of the firm's market capitalization on the day prior to the announcement of the fine (day t=-1). The dependent variable in Panel A is the adjusted CARs for the pre-announcement window (day t=-3 to day t=-1), and the dependent variable in Panel B is the adjusted CARs for the post-announcement window (day t=0 to day t=3). Models 1–4 regress each ownership characteristic individually. Models 5 and 6 demonstrate the interaction effects among the three measures of institutional holdings (total percent insider holdings; percentage held by institutional blockholders; and percentage held by the five largest institutional investors). Model 7 is a combined model with all ownership characteristics together. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

A. Dependent variable: adjusted (-3) to (-1) CARs

	1	2	3	4	5	6	7
const	0.048391**	0.048749**	0.035771	0.047485*	0.056412**	0.056405**	0.071186**
	(0.022727)	(0.023656)	(0.026404)	(0.027313)	(0.027810)	(0.027857)	(0.030798)
log(assets)	-0.003764***	-0.001453	-0.002026*	-0.001975*	-0.001716	-0.001712	-0.002479*
	(0.001269)	(0.001156)	(0.001161)	(0.001154)	(0.001163)	(0.001242)	(0.001400)
leverage	0.030912**	0.031088**	0.033221**	0.034791**	0.039406***	0.039370***	0.037377**
	(0.014234)	(0.013464)	(0.013825)	(0.013763)	(0.014028)	(0.014851)	(0.015391)
ROA	-0.193655*	-0.167063	-0.325153*	-0.326428*	-0.292764	-0.292655	-0.237898
	(0.109690)	(0.117029)	(0.188234)	(0.187098)	(0.187896)	(0.188670)	(0.197043)
Tobins Q	0.008662	0.005507	0.012087	0.011915	0.009382	0.009386	0.008981
	(0.008306)	(0.010439)	(0.014015)	(0.013939)	(0.014000)	(0.014023)	(0.014321)
insider_holdings	-0.449132*						-0.129629
	(0.271591)						(0.111976)
institutional_holdings		0.022584*				-0.000149	-0.007626
		(0.013467)				(0.019901)	(0.021286)
blockhldrs_holdings			-0.022369		0.088911	0.088753	0.069691
			(0.024382)		(0.054718)	(0.058690)	(0.061495)
top5_holdings				0.055336*	0.154498**	0.154102*	0.131584
				(0.030254)	(0.068090)	(0.086222)	(0.090057)
year effects	yes	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes	yes
n	537	537	537	537	537	537	537
Adj. R2	0.031513	0.021612	0.017956	0.023502	0.027129	0.024908	0.023569

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

B. Dependent variable: adjusted (0) to (3) CARs

	1	2	3	4	5	6	7
const	0.010369	0.027063	0.018199	0.029831	0.03896	0.038532	0.043518
	(0.027762)	(0.033702)	(0.033413)	(0.034602)	(0.035269)	(0.035323)	(0.038889)
log(assets)	-0.002890*	-0.001745	-0.002468*	-0.002422*	-0.002156	-0.001954	-0.002275
	(0.001495)	(0.001521)	(0.001469)	(0.001462)	(0.001475)	(0.001575)	(0.001767)
leverage	0.023021	0.021583	0.025353	0.026854	0.031574*	0.029305	0.031386
	(0.016464)	(0.017665)	(0.017495)	(0.017436)	(0.017790)	(0.018831)	(0.019435)
ROA	-0.470878***	-0.469376**	-0.502642**	-0.504493**	-0.470066**	-0.463247*	-0.464268*
	(0.171972)	(0.236878)	(0.238206)	(0.237031)	(0.238291)	(0.239235)	(0.248811)
Tobins Q	0.024437**	0.023962	0.02455	0.02442	0.02183	0.022029	0.022415
	(0.011757)	(0.017643)	(0.017736)	(0.017659)	(0.017755)	(0.017781)	(0.018083)
insider_holdings	0.100733						0.049363
	(0.149100)						(0.145423)
institutional_holdings		0.050377***				-0.030507	-0.027167
		(0.018268)				(0.026344)	(0.027644)
blockhldrs_holdings			0.020312		-0.180492**	-0.148207*	-0.149590*
			(0.032485)		(0.072545)	(0.077692)	(0.079864)
top5_holdings				0.077490*	0.278791***	0.197858*	0.209474*
				(0.040272)	(0.090272)	(0.114138)	(0.116957)
year effects	yes	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes	yes
n	537	537	537	537	537	537	537
Adj. R2	0.040789	0.066129	0.050832	0.057916	0.068899	0.069621	0.06218

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 8—Governance rankings and CARs

This table reports the results of regressions of third-party ratings of firm governance on the adjusted Cumulative Abnormal Returns ("CARs") before (Panel A) and after (Panel B) the announcement of a fine. The CARs are adjusted by adding the amount of the fine as a proportion of the firm's market capitalization on the day prior to the announcement of the fine (day t=-1). The dependent variable in Panel A is the adjusted CARs for the pre-announcement window (day t=-3 to day t=-1), and the dependent variable in Panel B is the adjusted CARs for the post-announcement window (day t=0 to day t=3). The Sustainalytics rating of firm governance quality and the Bloomberg rating of firm governance-related disclosure are used. Whereas the Sustainalytics rating aims to measure governance quality, the Bloomberg rating simply measures the quantity of governance-related data disclosed by the firm. Models 1–2 regress each rating individually, and Model 3 is a combined model with both characteristics together. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

A. Dependent variable: adjusted (-3) to (-1) CARs

	1	2	3
const	-0.003903	-0.054035	-0.053701
	(0.021591)	(0.036056)	(0.036290)
log(assets)	-0.004092*	-0.005504***	-0.004272*
	(0.002238)	(0.001988)	(0.002266)
leverage	0.011704	-0.008739	-0.008821
	(0.013956)	(0.014060)	(0.014107)
ROA	-0.749047**	-0.752838**	-0.832529**
	(0.328470)	(0.355869)	(0.362541)
Tobins Q	0.005845	0.031239	0.031501
	(0.008530)	(0.021252)	(0.021475)
Bloomberg Score	0.028793		-0.003744
	(0.033208)		(0.041314)
Sustainalytics Score		0.052188**	0.053869*
		(0.023902)	(0.030278)
year effects	yes	yes	yes
industry group effects	yes	yes	yes
n	537	537	537
Adj. R2	0.072826	0.067952	0.06933

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

B. Dependent variable: adjusted (0) to (3) CARs

	1	2	3
const	-0.057145**	-0.00992	-0.022158
	(0.023860)	(0.042494)	(0.048492)
log(assets)	0.001733	0.000805	-0.000643
	(0.001746)	(0.002451)	(0.002937)
leverage	0.037127*	0.037352*	0.038676*
	(0.021593)	(0.020272)	(0.021742)
ROA	0.127413	-0.146334	-0.28057
	(0.121787)	(0.286043)	(0.334176)
Tobins Q	-0.005776	0.006784	0.01126
	(0.009426)	(0.023903)	(0.028696)
Bloomberg Score	0.076414**		0.024484**
	(0.036697)		(0.011587)
Sustainalytics Score		0.002013	0.007944
		(0.018395)	(0.022752)
year effects	yes	yes	yes
industry group effects	yes	yes	yes
n	537	537	537
Adj. R2	0.009803	0.004174	0.00783

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 9—Board Characteristics and CARs

This table reports the results of regressions of various board characteristics on the adjusted Cumulative Abnormal Returns ("CARs") before (Panel A) and after (Panel B) the announcement of a fine. The CARs are adjusted by adding the amount of the fine as a proportion of the firm's market capitalization on the day prior to the announcement of the fine (day t=-1). The dependent variable in Panel A is the adjusted CARs for the pre-announcement window (day t=-3 to day t=-1), and the dependent variable in Panel B is the adjusted CARs for the post-announcement window (day t=0 to day t=3). Models 1–5 regress each board characteristic individually, and Model 6 is a combined model with all characteristics together. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

A. Dependent variable: adjusted (-3) to (-1) CARs

	1	2	3	4	5	6
const	0.033962	0.031001	0.033642	0.039706	0.062094**	0.085631*
	(0.022260)	(0.024465)	(0.035243)	(0.031065)	(0.027731)	(0.047670)
log(assets)	-0.002928**	-0.002999**	-0.003205**	-0.002675*	-0.001847	-0.001405
	(0.001214)	(0.001290)	(0.001272)	(0.001373)	(0.001353)	(0.001758)
leverage	0.027301*	0.028929*	0.032489**	0.029118*	0.024776*	0.017549
	(0.015015)	(0.016142)	(0.015589)	(0.015020)	(0.015029)	(0.018014)
ROA	-0.199635*	-0.205122*	-0.205466*	-0.209386*	-0.216152*	-0.228599*
	(0.117053)	(0.117506)	(0.121972)	(0.117654)	(0.117513)	(0.123690)
Tobins Q	0.009193	0.009185	0.008151	0.009763	0.01104	0.011694
	(0.009008)	(0.009184)	(0.009502)	(0.009050)	(0.009100)	(0.009758)
CEO duality	-0.000999					0.00089
	(0.005097)					(0.005548)
log(board meetings per year)		0.001425				0.002908
		(0.006649)				(0.007114)
board meetings attendance			0.006456			0.017167
			(0.031694)			(0.032927)
log(board_size)				-0.003921		-0.013961
				(0.012128)		(0.013516)
% independent directors					-0.047261*	-0.062999**
					(0.026951)	(0.031039)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	537	537	537	537	537	537
Adj. R2	0.026749	0.025743	0.024892	0.025891	0.031162	0.026141

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

B. Dependent variable: adjusted (0) to (3) CARs

	1	2	3	4	5	6
const	-0.046877**	-0.049737*	-0.055696	-0.051016	-0.049674*	-0.096925*
	(0.022998)	(0.025541)	(0.037016)	(0.032443)	(0.029052)	(0.049701)
log(assets)	0.004915***	0.003945***	0.004334***	0.004020***	0.003950***	0.004078**
	(0.001254)	(0.001346)	(0.001336)	(0.001434)	(0.001417)	(0.001833)
leverage	-0.001812	-0.003177	0.00273	0.002363	0.002086	0.003003
	(0.015512)	(0.016853)	(0.016374)	(0.015686)	(0.015745)	(0.018782)
ROA	0.112376	0.132016	0.122763	0.131561	0.127906	0.117919
	(0.120929)	(0.122676)	(0.128110)	(0.122873)	(0.123109)	(0.128959)
Tobins Q	-0.002909	-0.003534	-0.002671	-0.003691	-0.004092	-0.003825
	(0.009306)	(0.009588)	(0.009981)	(0.009451)	(0.009534)	(0.010174)
CEO duality	-0.013697***					-0.015240***
	(0.005266)					(0.005784)
log(board meetings per year)		0.004609				0.000386
		(0.006941)				(0.007417)
board meetings attendance			0.015291			0.020876
			(0.033289)			(0.034329)
log(board_size)				0.00453		0.01011
				(0.012666)		(0.014092)
% independent directors					0.012091	0.021164
					(0.028234)	(0.032362)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	537	537	537	537	537	537
Adj. R2	0.038563	0.027259	0.0255	0.026882	0.026454	0.031177

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 10—Executive compensation and CARs

This table reports the results of regressions of various executive compensation characteristics on the adjusted Cumulative Abnormal Returns ("CARs") before (Panel A) and after (Panel B) the announcement of a fine. The CARs are adjusted by adding the amount of the fine as a proportion of the firm's market capitalization on the day prior to the announcement of the fine (day t=-1). The dependent variable in Panel A is the adjusted CARs for the pre-announcement window (day t=-3 to day t=-1), and the dependent variable in Panel B is the adjusted CARs for the post-announcement window (day t=0 to day t=3). Models 1–5 regress each compensation characteristic individually, and Model 6 is a combined model considering the ratio of total executive compensation to revenues along with the ratio of variable compensation to total compensation. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

A. Dependent variable: adjusted (-3) to (-1) CARs

	1	2	3	4	5	6
const	0.023773	0.028456	0.035233	0.031285	0.034762	0.027703
	(0.022443)	(0.021004)	(0.021968)	(0.020466)	(0.021275)	(0.023438)
log(assets)	-0.002021	-0.002716**	-0.003295**	-0.002726**	-0.003364**	-0.002726
	(0.001343)	(0.001111)	(0.001619)	(0.001139)	(0.001564)	(0.001803)
leverage	0.030746**	0.032861**	0.032016**	0.030170**	0.029832**	0.029728**
	(0.013964)	(0.014404)	(0.014063)	(0.014564)	(0.013836)	(0.014081)
ROA	-0.184596*	-0.192134*	-0.191894*	-0.199194*	-0.203108*	-0.191756*
	(0.110112)	(0.108828)	(0.108939)	(0.110488)	(0.108842)	(0.110858)
Tobins Q	0.008732	0.009675	0.008669	0.009898	0.009696	0.008795
	(0.008379)	(0.008204)	(0.008483)	(0.008359)	(0.008203)	(0.008385)
total exec comp to revenues	0.183371					0.17701
	(0.186960)					(0.187394)
percent options comp		0.029604				
		(0.055051)				
percent stock comp			0.010393			
			(0.020695)			
percent cash bonuses				0.001447		
				(0.015827)		
percent total variable comp					0.009017	0.009142
					(0.015048)	(0.015602)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	537	537	537	537	537	537
Adj. R2	0.026588	0.026722	0.026653	0.026195	0.026853	0.058322

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

B. Dependent variable: adjusted (0) to (3) CARs

	1	2	3	4	5	6
const	-0.007187	0.016612	0.015541	0.017114	0.014674	-0.011462
	(0.025568)	(0.024101)	(0.025205)	(0.023475)	(0.024410)	(0.026702)
log(assets)	-0.000602	-0.002795**	-0.002474	-0.002692**	-0.002233	0.000165
	(0.001530)	(0.001275)	(0.001858)	(0.001306)	(0.001795)	(0.002054)
leverage	0.02454	0.024499	0.02281	0.025401	0.024212	0.025648
	(0.015908)	(0.016528)	(0.016135)	(0.016706)	(0.015874)	(0.016042)
ROA	-0.235034*	-0.252783**	-0.257760**	-0.246648*	-0.249972**	-0.227247*
	(0.125443)	(0.124873)	(0.124994)	(0.126734)	(0.124879)	(0.126296)
Tobins Q	0.011666	0.013857	0.014467	0.013268	0.013937	0.011598
	(0.009546)	(0.009414)	(0.009733)	(0.009588)	(0.009412)	(0.009553)
total exec comp to revenues	0.668919***					0.669209***
	(0.239418)					(0.239621)
percent options comp		0.012229				
		(0.063167)				
percent stock comp			-0.005541			
			(0.023745)			
percent cash bonuses				-0.006167		
				(0.018154)		
percent total variable comp					-0.007594	-0.009944
					(0.017265)	(0.017775)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	537	537	537	537	537	537
Adj. R2	0.030554	0.015274	0.015306	0.015422	0.01557	0.062104

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 11—Accounting data and regulatory penalties

This table reports the results of regressions exclusively of accounting data on the total annual financial-related penalties imposed on a firm as a proportion of total annual firm revenues ("penalties to revenues"). Model 1 includes only the accounting variables used as controls in all other regressions on penalties to revenues in subsequent tables. Model 2 repeats this regression for the subset of companies for which data on the firm's tier one capital ratio and ratio of non-performing loans to total loans are available. Models 3–5 show the results of regressions including: only the tier 1 capital ratio (Model 3), only the ratio of non-performing loans to total loans (Model 4), and both the tier one capital ratio and ratio of non-performing loans to total loans (Model 5). All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: penalties_to_reveneus					
	1	2	3	4	5
const	-0.020816	-0.039642	-0.058012**	-0.039484	-0.047768*
	(0.019226)	(0.028826)	(0.026023)	(0.028919)	(0.028680)
Tobins Q	0.016046*	0.011944	0.015288	0.012941	-0.003349
	(0.008555)	(0.018908)	(0.018968)	(0.019191)	(0.023285)
leverage	0.052611***	0.062532***	0.033856*	0.062510***	0.064372**
	(0.012980)	(0.019450)	(0.019939)	(0.019510)	(0.027532)
ROA	-0.232608*	-0.377455*	-0.313077	-0.399026*	-0.468905**
	(0.123338)	(0.215389)	(0.204075)	(0.225169)	(0.235931)
log(assets)	0.000561	0.002363*	0.002758**	0.002267*	0.002532*
	(0.001034)	(0.001286)	(0.001277)	(0.001321)	(0.001491)
Tier1_cap_ratio			0.012684		0.097937
			(0.026368)		(0.061267)
NPL_to_total Loans				-0.103576	-0.130227
				(0.304589)	(0.305137)
year effects	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes
n	279	156	156	156	156
Adj. R2	0.067754	0.229457	0.114714	0.144528	0.14542

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 12—Ownership characteristics and regulatory penalties

This table reports the results of regressions of firm ownership characteristics on the total annual financial-related penalties imposed on a firm as a proportion of total annual firm revenues ("penalties to revenues"). Models 1–4 regress each ownership characteristic individually. Models 5 and 6 demonstrate the interaction effects among the three measures of institutional holdings (total percent of insider holdings, percentage held by institutional blockholders, and percentage held by the five largest institutional investors). Model 7 is a combined model with all ownership characteristics together. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: penalties_to_reveneus

	1	2	3	4	5	6	7
const	-0.021368	-0.002775	-0.006749	0.013735	0.025674	0.027592	0.016398
	(0.022444)	(0.026961)	(0.027303)	(0.027732)	(0.027681)	(0.027841)	(0.029940)
Tobins Q	0.018345**	0.027125**	0.027446**	0.027005**	0.023190*	0.022452*	0.024626*
	(0.009074)	(0.012708)	(0.012837)	(0.012568)	(0.012464)	(0.012520)	(0.012519)
leverage	0.055739***	0.062193***	0.063649***	0.065665***	0.071502***	0.073506***	0.070297***
	(0.014361)	(0.015481)	(0.015583)	(0.015276)	(0.015206)	(0.015476)	(0.015707)
ROA	-0.304469**	-0.352189**	-0.394902**	-0.390309**	-0.339061**	-0.345295**	-0.426536**
	(0.130481)	(0.169418)	(0.171222)	(0.167603)	(0.166226)	(0.166645)	(0.170881)
log(assets)	0.000442	0.000857	-0.000359	-0.000139	0.000539	0.000192	0.000481
	(0.001265)	(0.001348)	(0.001298)	(0.001270)	(0.001277)	(0.001366)	(0.001461)
insider_holdings	0.07077						0.042889
	(0.086294)						(0.095806)
institutional_holdings		-0.035769**				0.014982	0.016265
		(0.014251)				(0.020799)	(0.021907)
blockhldrs_holdings			-0.046206*		0.155734***	0.173244***	0.158314**
			(0.026913)		(0.057867)	(0.062828)	(0.064888)
top5_holdings				-0.108015***	-0.280654***	-0.324054***	-0.297441***
				(0.032794)	(0.071827)	(0.093815)	(0.096819)
year effects	yes	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes	yes
n	279	279	279	279	279	279	279
Adj. R2	0.085095	0.112483	0.098313	0.131015	0.156455	0.15448	0.150189

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 13—Governance rankings and regulatory penalties

This table reports the results of regressions of third-party ratings of firm governance on the total annual financial-related penalties imposed on a firm as a proportion of total annual firm revenues ("penalties to revenues"). The Sustainalytics rating of firm governance quality and the Bloomberg rating of firm governance-related disclosure are used. Whereas the Sustainalytics rating aims to measure governance quality, the Bloomberg rating simply measures the quantity of governance-related data disclosed by the firm. Models 1–2 regress each rating individually, and Model 3 is a combined model with both characteristics together. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: penalties_to_reveneus			
	1	2	3
const	-0.031377	-0.042626*	-0.053572
	(0.036220)	(0.022181)	(0.037297)
Tobins Q	0.048089**	0.022005**	0.053721***
	(0.018492)	(0.009723)	(0.019442)
leverage	0.043949***	0.051910***	0.037213**
	(0.015486)	(0.013945)	(0.015491)
ROA	-0.605815**	-0.343770**	-0.726332***
	(0.233265)	(0.138415)	(0.227179)
log(assets)	-0.001777	-0.000746	-0.003265
	(0.002131)	(0.001535)	(0.002496)
Bloomberg score	-0.027358*		-0.033061**
	(0.015979)		(0.016523)
Sustainalytics score		0.050469	0.051521
		(0.036323)	(0.043553)
year effects	yes	yes	yes
industry group effects	yes	yes	yes
n	279	279	279
Adj. R2	0.093238	0.082184	0.134366

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 14—Board Characteristics and Regulatory Penalties

This table reports the results of regressions of board characteristics on the total annual financial-related penalties imposed on firm as a proportion of total annual firm revenues ("penalties to revenues"). Models 1–5 regress each board characteristic individually, and Model 6 is a combined model with all characteristics together. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: penalties_to_reveneus

	1	2	3	4	5	6
const	-0.036119	0.008445	-0.026054	-0.022125	-0.029469	0.008363
	(0.029669)	(0.025372)	(0.022879)	(0.033374)	(0.021177)	(0.044543)
Tobins Q	0.020704**	0.024081**	0.020938**	0.021783**	0.020411**	0.025261**
	(0.010017)	(0.010021)	(0.010029)	(0.010120)	(0.009980)	(0.010252)
leverage	0.058100***	0.049334***	0.057600***	0.057488***	0.053312***	0.048135***
	(0.015043)	(0.014517)	(0.015340)	(0.014433)	(0.014493)	(0.016740)
ROA	-0.298748**	-0.332584**	-0.301034**	-0.311814**	-0.289259**	-0.345298**
	(0.142619)	(0.142126)	(0.142961)	(0.143795)	(0.142241)	(0.145172)
log(assets)	0.000309	0.00198	0.000677	0.00033	0.00101	0.002361
	(0.001328)	(0.001268)	(0.001235)	(0.001157)	(0.001177)	(0.001624)
log(board_size)	0.004519					-0.004097
	(0.011578)					(0.012354)
% independent directors		-0.061988**				-0.066902**
		(0.024126)				(0.025210)
log(board meetings per year)			-0.001486			-0.001144
			(0.006505)			(0.006784)
board meetings attendance				-0.004188		0.011724
				(0.030818)		(0.032232)
CEO duality					-0.010619*	-0.005632
					(0.005839)	(0.005557)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	279	279	279	279	279	279
Adj. R2	0.065096	0.091297	0.064704	0.061202	0.071642	0.072682

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 15—Executive Compensation and Regulatory Penalties

This table reports the results of regressions of executive compensation characteristics on the total annual financial-related penalties imposed on firm as a proportion of total annual firm revenues ("penalties to revenues"). Models 1–5 regress each compensation characteristic individually, and Model 6 is a combined model considering the ratio of total executive compensation to revenues along with the ratio of total variable compensation to total compensation. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: penalties_to_reveneus						
	1	2	3	4	5	6
const	-0.051513**	-0.019455	-0.015784	-0.017306	-0.008898	-0.036566*
	(0.020689)	(0.019582)	(0.020363)	(0.019247)	(0.019801)	(0.022100)
Tobins Q	0.016209*	0.016850*	0.016244*	0.018127**	0.016476*	0.015075*
	(0.008409)	(0.008647)	(0.008665)	(0.008599)	(0.008551)	(0.008759)
leverage	0.052669***	0.054013***	0.055379***	0.047998***	0.052022***	0.057514***
	(0.012785)	(0.013421)	(0.013213)	(0.013451)	(0.013036)	(0.013866)
ROA	-0.217542*	-0.251548**	-0.253194**	-0.263267**	-0.264086**	-0.230708*
	(0.121961)	(0.125413)	(0.124818)	(0.124177)	(0.123864)	(0.126252)
log(assets)	0.003070**	0.000392	-0.000263	0.000033	-0.001684	0.000862
	(0.001252)	(0.001050)	(0.001477)	(0.001058)	(0.001408)	(0.001646)
total exec comp to revenues	0.513982***					0.558680***
	(0.138512)					(0.143939)
percent options comp		-0.004845				
		(0.045847)				
percent stock comp			0.011235			
			(0.018087)			
percent cash bonuses				0.026606*		
				(0.014175)		
percent total variable comp					0.028561**	0.026529*
					(0.013133)	(0.014159)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	279	279	279	279	279	279
R2	0.169828	0.125900	0.127158	0.137548	0.141479	0.20132

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 16—Cost of Capital

This table reports the results of regressions of governance and ownership characteristics along with penalties data on firm cost of capital. The dependent variable in Panel A is cost of debt, and the dependent variable in Panel B is cost of equity. Model 1 is a base case with only control variables. Models 2 contains firm annual penalties data. Models 3–6 incorporate ownership and governance data along with penalties data. All independent variables are lagged by one year. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10%, **5%, and ***1% levels. Definitions of all variables along with relevant calculations appear in Table 1.

A. Dependent variable: cost of debt

	1	2	3	4	5	6
const	2.514248***	2.505559***	2.111263***	1.757556***	2.621442***	3.460349***
	(0.378694)	(0.378845)	(0.491604)	(0.479104)	(0.405679)	(0.646626)
Tobins Q	0.339204*	0.364903*	0.480153**	0.379207	0.311518	0.238223
	(0.195284)	(0.195327)	(0.214191)	(0.256525)	(0.193703)	(0.379553)
leverage	-0.02798	0.077484	0.096258	0.115025	0.104826	0.139736
	(0.234414)	(0.242815)	(0.276509)	(0.257691)	(0.240750)	(0.268823)
ROA	-2.986151	-3.442318	-5.008084*	-2.804723	-2.666265	-1.273822
	(2.540665)	(2.546073)	(2.886614)	(2.983727)	(2.545573)	(4.378295)
log(assets)	-0.034352*	-0.034695*	-0.003186	-0.050262**	-0.009395	-0.067496
	(0.018812)	(0.018788)	(0.023957)	(0.022453)	(0.027128)	(0.041243)
penalties_to_revenues		1.824529*	2.22462*	1.354246	1.011457	1.35381
		(1.024407)	(1.133420)	(1.026429)	(1.060186)	(1.321221)
insider_holdings			0.330071			
			(1.585790)			
institutional_holdings			-0.116253			
			(0.359648)			
blockhldrs_holdings			1.853086*			
			(1.114555)			
top5_holdings			-0.554936**			
			(0.274923)			
CEO duality				0.099042		
				(0.088323)		
% independent directors				-1.072001***		
				(0.398374)		
total exec comp to revenues					4.313309	
					(2.660060)	
percent total variable comp					0.573543**	
					(0.233587)	
Bloomberg Score						-0.895519
						(0.734146)
Sustainalytics Score						-0.630927**
						(0.288388)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	279	279	279	279	279	279
Adj. R2	0.527461	0.531642	0.556395	0.46055	0.544251	0.535883

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

B. Dependent variable: cost of equity

	1	2	3	4	5	6
const	7.840490***	7.720159***	7.759335***	9.748089***	8.274900***	7.910217***
	(1.168522)	(1.174950)	(1.773355)	(1.466262)	(1.303446)	(2.361245)
Tobins Q	0.456638	0.507127	0.244643	0.454081	0.511686	-0.982622
	(0.508508)	(0.512557)	(0.754969)	(0.587774)	(0.513827)	(1.261657)
leverage	0.246066	0.461528	0.279407	-0.02532	0.404518	0.104352
	(0.815046)	(0.846128)	(1.006791)	(0.907293)	(0.851071)	(0.994563)
ROA	-10.457875	-11.143445	-14.331196	-11.926906	-11.551472	-9.391483
	(7.292082)	(7.359861)	(10.275184)	(8.246322)	(7.411596)	(14.866807)
log(assets)	0.328595***	0.328673***	0.365736***	0.367223***	0.281995***	0.257808
	(0.064048)	(0.064136)	(0.086471)	(0.078451)	(0.095868)	(0.158028)
penalties_to_revenues		-2.689074	-4.960476	-5.307226	-1.673622	-6.035991
		(3.604314)	(4.233184)	(3.729395)	(3.755250)	(5.042028)
insider_holdings			9.356287			
			(5.838315)			
institutional_holdings			-0.169465			
			(1.324610)			
blockhldrs_holdings			0.998248*			
			(0.543447)			
top5_holdings			-0.635747**			
			(0.274698)			
CEO duality				-0.366762		
				(0.319909)		
% independent directors				-2.502553*		
				(1.458492)		
total exec comp to revenues					-9.451502	
					(8.630890)	
percent total variable comp					0.002236	
					(0.830477)	
Bloomberg Score						-2.04803**
						(0.882299)
Sustainalytics Score						0.446056
						(1.088881)
year effects	yes	yes	yes	yes	yes	yes
industry group effects	yes	yes	yes	yes	yes	yes
n	279	279	279	279	279	279
Adj. R2	0.587508	0.58789	0.582045	0.599105	0.586512	0.63632

Standard errors appear in parentheses below coefficients

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

Table 17—Robustness Checks

This table reports the results of robustness checks. It considers the total cumulative fines levied against firms over the 2006–2008 time period. As this encompasses the time of the financial crisis, it serves as a shock to the financial services sector. The firms are then segmented into thirds and for the top and bottom third calculate the mean ownership statistics for the first and last years in the dataset (2006 and 2017). The differences in means are calculated and the statistical significance of the differences is indicated based on the results of a two-sided t-test; statistical significance is denoted at the *10%, **5%, and ***1% levels.

Although all ownership measures increased over the time period 2006–2017, the increase was greater for the highest-fined companies for total blockholder ownership. Conversely, the increases are less for the highest-fined companies for total institutional ownership and the ownership percentage of the five largest institutional ownership. This is consistent with the previous results showing that blockholder ownership is associated with greater fines and total institutional ownership, and ownership of the five largest investors are associated with lower levels of fines. This robustness check also provides additional evidence that the effect changes over time: blockholders increase their stakes more significantly in more offending firms with higher levels of fines, while the five largest investors and institutional investors more broadly increase stakes to a greater extent in less offending firms with lower levels of fines.

	2006-2008 cummulative fines	2006 mean	2017 mean	diff in means (2017-2006)
total institutional ownership	highest fines third:	0.645	0.751	0.106**
	lowest fines third:	0.676	0.809	0.133**
total blockholder ownership	highest fines third:	0.118	0.280	0.162***
	lowest fines third:	0.127	0.232	0.105***
top5 ownership	highest fines third:	0.239	0.317	0.077**
	lowest fines third:	0.218	0.345	0.127**

* significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level

6 Financial and Governance Aspects of Firms as Drivers of Captive Insurance Usage

Abstract

This chapter examine the effects of captive insurance usage on firm borrowing costs, marginal tax rates, dividend payouts and investments in intangible asset development. Using a panel dataset from 2009 to 2016, I find that firms using captive insurance benefit from decreased borrowing costs and marginal tax rates, as well as from its association with increased dividend payments and greater levels of investment in intangible asset development. My results hold when considering the ex-post and ex-ante situations of firms adopting captive insurance structures. Firms with higher levels of holdings by insiders and institutional blockholders are more likely to use captive insurance, as are firms with higher levels of total executive compensation and higher proportions of stock-based compensation. However, firms with higher proportions of options-based compensation are less likely to use captive insurance. Comparisons across financial and governance models indicate that the relationship between captive insurance usage and governance variables is stronger than the relationship between captive insurance usage and financial variables.

6.1 Introduction

Captive insurance is an increasingly popular risk-management tool used by firms of all sizes and across all industries. A captive is a wholly-owned subsidiary insurance company created by a parent company to pool or finance its own risks. An insurance captive provides a mechanism for firms to self-insure certain risks while providing financial and tax benefits, as well as direct access to the wholesale reinsurance markets (Culp, 2006; Rejda and McNamara, 2017). In recent years, the insurance captives industry has witnessed an increased form of regulatory competition among jurisdictions, particularly in the US, where more than 3,100 captives are domiciled in Vermont, Utah, Delaware and North Carolina (Bruner, 2020; LaCroix, 2022). Existing research has focused mainly on the role of captives as a risk-sharing arrangement for large firms. As a result, little is known about the impact of captive usage on financial performance. Moreover, although larger firms are more likely to account for a significant fraction of insurance captives, the extent to which the use of insurance captives is associated with a firm's insider holdings and holdings by institutional blockholders is unclear.

Theory suggests that under perfect market conditions, firms would not engage in insurance transactions or hedging because the costs involved would erode firm value. However, the literature on corporate hedging suggests that, because of market imperfections, insurance and hedging activities by firms can have a positive financial impact (Froot et al., 1993; Aretz and Bartram, 2010). Prior studies find that by decreasing the volatility of cash flows over time, hedging has been shown to lower a firm's costs of financial distress, thereby allowing it to access credit markets more cheaply. Also due to the reduction in the volatility of a firm's profits and losses over time, hedging has been shown to help firms lower their effective tax rates (Smith and Stulz, 1985). Thanks to decreased variability in earnings, hedging also enables firms to increase expenditures on dividends and investments.

A second explanation for hedging and insurance usage involves aspects of corporate governance. In a firm with a concentrated number of large investors, the investors are incentivized to push the firm to engage in hedging and insurance activities, as it is cheaper for the firm to hedge these risks than it is for individual investors who have large exposures to the firm. This is the case, even though most shareholders with smaller stakes in the firm would find it cheaper to diversify such risks through portfolio diversification (Main, 1982). Similarly, in a firm in which executives are largely invested in the firm (in terms of insider shareholdings and stock and options compensation), these executives are incentivized to hedge and insure the assets they hold in the firm through firm-wide hedging and insurance activities, as they may not be able to diversify such risks through portfolio diversification if a large portion of their assets is tied up in firm securities. This would also be the case in firms with large stakes held by a founder or a founder's family. Hedging and insurance activities also matter for firms with large shareholdings by passive institutional investors. Indeed, since there is likely to be less scrutiny of management activity, management may find it in their best interest to engage in captive insurance usage in order to provide greater financial stability and, consequently, employment stability – especially if we consider that management's human capital is invested in the firm.

Two opposing views can be distinguished with respect to the relation between firms and the use of captive arrangements. The first holds that the tax deductibility provided to captive insurers plays a role in how firms choose their risk-management strategies. This view is based on a large literature that suggests that the benefit of income taxation is a key factor in

why firms establish captive insurance structures (Cross et al., 1988; Han and Lai, 1991; Lai and Witt, 1995; Porat and Powers, 1995; Scordis and Porat, 1998). Conversely, the second view holds that financial issues explain the formation of a captive insurance subsidiary by larger firms. This view holds that the use of captives helps to promote the firm value of the non-insurance parent corporation (Chang and Chen, 2019; Scordis et al., 2007). To address these two views, I analyze the financial effects of captive insurance usage and the connection with the corporate governance characteristics of firms using captive insurance structures.

To examine whether captive insurance usage will yield similar benefits as hedging, I use a panel dataset consisting of the annual financial data of US-listed non-financial corporations with securities registered with the SEC over the period 2009-2016 to explain non-financial firms' use of captive insurance structures and the impact on firm financials. The annual financial data are supplemented with evidence of captive insurance usage gleaned from keyword searches and subsequent manual screening of SEC filings for all firms in the dataset. I screened financial filings dating back to 1994 in order to find any earlier mentions of captive insurance usage.

As there is no comprehensive database of governance measures to analyze for firms' captive insurance usage, I take a three-pronged approach. First, I examine the relationship between firms' use of captive insurance and their financial characteristics over time and identify its statistically significant effects on borrowing costs, effective marginal tax rates, and expenditures on dividends and investments. Second, I examine the relationship between insider and institutional investor holdings data, as well executive compensation data, in order to compare the governance aspects of firms that do and do not use captive insurance structures. Third, I compare the relative power of the financial versus corporate governance motives through a comparison of the econometric models.

To characterize the role played by captive insurance structures, I first present evidence showing that the use of captive insurance subsidiaries is widespread among large and midsize companies in the US. Those same tabulations point to a notable pattern in the data. For example, firms utilizing a captive insurance structure tend to have a larger market capitalization and more broadly diversified business structures. Consistent with my first

hypotheses, I find that firms' captive insurance usage decreases the costs of financial distress by indicating a strong relationship between captive insurance and decreased borrowing costs.

My second hypothesis is linked to the literature on the tax deductibility of premiums paid to captive insurers (Cross et al., 1988; Han and Lai, 1991; Hofflander and Nye, 1984; Lai and McNamara, 2004; Lai and Witt 1995). The tax savings literature has shown that the growth of captive insurance usage is linked to favorable tax treatment of captive subsidiaries. My empirical findings support the tax savings hypothesis. I predict that captive insurance allows firms to take advantage of tax effects, resulting in lower effective marginal tax rates. My findings suggest that companies enjoy a lower tax rate once they adopt a captive insurance arrangement and that this benefit persists over time.

Next, I study whether firms using captive insurance structures are driven by corporate dividend policies. My third hypothesis is that firms using captive insurance are able to commit to higher levels of expenditures on dividends. To gauge how companies' captive insurance arrangements are likely to affect dividend payouts, I use OLS models in which the dependent variable is the sum of all dividend payments and share repurchases scaled by total assets. These regressions also contain a number of controls, including proxies for firm size, leverage effects, intangible assets and industry-fixed effects.

I also explore the relationship between captive insurance usage and firm investments in intangible asset development. An analysis of executive compensation data shows, as predicted, that greater absolute levels of executive compensation, as well as higher proportions of stock-based compensation, are correlated with a higher likelihood of captive insurance usage, while higher proportions of options-based compensation are related to a lower likelihood of captive insurance usage.

Another factor reinforcing the use of captive insurance is holdings by insiders and large shareholders. Models including holdings data show that, as predicted, higher levels of insider holdings are also strongly correlated with captive insurance usage. While there are competing hypotheses on the role of institutional blockholders, my results suggest that such holdings are related to higher likelihoods of captive insurance usage, though the strength of this

relationship is weaker than with other governance variables. Finally, comparisons across financial and governance models show a stronger relationship between governance variables and captive insurance usage, indicating that governance considerations dominate financial ones.

This chapter contributes to the literature in three ways. First, it contributes to the literature on risk management by showing that captive insurance and hedging have similar effects in addressing risk (see, for example, Mayers and Smith, 1990; Yamori, 1999; Hoyt and Khang, 2000; Adams and Buckle, 2003; Adams and Zou, 2008; Regan and Hur, 2007; Picard and Pinquet, 2011). Moreover, this chapter is also related to the literature on the role of risk-management strategies in reducing R&D risk (Geczy et al., 1997; Lewent and Kearney, 1990). The findings of this chapter confirm the predictions made in the theoretical literature on corporate risk management, hedging, and insurance usage and are consistent with the previously mentioned empirical studies on the financial effects of hedging (Aretz and Bertram, 2010; Haushalter, 2000; Graham and Rogers, 2002; Nance et al., 1993). Similarly, the results related to captive insurance and governance are largely consistent with predictions based on the prior theoretical and empirical literature on hedging and governance (Tufano, 1996; Scordis and Porat, 1998; Geczy et al., 1997; Knopf et al., 2002). Furthermore, by investigating the link between corporate governance and the financial implications of hedging, this chapter links the previous strands of literature exploring governance and financial motives of hedging (Froot et al., 1993; Lessard, 1991; Smith and Stulz, 1985).

The remainder of the chapter is organized as follows: Section 2 discusses the theoretical background and hypothesis development in the context of the relevant prior literature. Section 3 presents the dataset and methodology of the analyses. Section 4 discusses the results of the analyses, and Section 5 concludes the chapter.

6.2 Theory and Hypotheses

This section briefly introduces the background of the captive insurance decision of parent corporations and the tested hypotheses.

The literature on the corporate choice to form a corporate insurance subsidiary suggests that it may be an effective mechanism for reducing the firm's exposure to company-specific risks. Some prior literature has examined the effect of captive insurance formation (Cross et al., 1986). Interestingly, Adams and Hillier (2000) find that the formation of a captive insurance subsidiary elicits no market reaction. The rationale is that firms with a captive insurance subsidiary are likely to have agency conflicts and poor managerial ethics (Scordis and Porat, 1998). Similar results are found in Wood et al. (1988) and Diallo and Kim (1989) in the context of US captive insurance studies. Therefore, while prior research has typically shown that there is little, if any, shareholder value associated with forming a captive insurance subsidiary, I focus on whether the predictive impacts of captive insurance usage on firms' risk management can increase firm value. Furthermore, I test the predicted governance motives for adopting captive insurance structures and compare the relationship between the financial and governance motives. I begin with an overview of captive insurance and the theoretical predictions of its impacts on firm financials found in the risk management literature.

6.2.1 Background on captive insurance

The motive to create a captive insurance arrangement is to self-insure against some of the business risks of the parent corporation. While there are many types of captives, and while they vary in the types of risks covered, all captives allow companies an opportunity to diversify their risks. For example, a firm can self-insure by simply setting aside cash provisions in the event of realized losses or by establishing a subsidiary company to act as an insurance provider. In the latter case, the subsidiary company is said to be a captive insurance entity. The operational entities of the firm identify risks they wish to self-insure and essentially purchase insurance for these risks from its own captive insurance subsidiary. A company that decides to self-insure by setting aside cash reserves must generally do so with taxable income; however, the parent company can generally deduct insurance premiums paid to a firm's captive insurance subsidiary as operating expenses (Main, 1982, 1983). As is also the case with third-party insurance companies, the premiums are invested in order to pay out claims when they arise. The captive insurance entity can also pool all of the insured liabilities from related group entities and resell the risk to reinsurance companies. In this way, the captive insurance entity provides the consolidated firm with access to the reinsurance market,

in which risks can be externally insured more cheaply than if each individual group entity in the consolidated firm purchased insurance separately.

Captive insurance companies may be domiciled in financial centers, where there are generally legal and tax advantages for insurance and reinsurance firms. The most popular offshore domiciles for captive insurance entities tend to be Bermuda, the Channel Islands, the Isle of Man and, to a lesser extent, Luxembourg (Adams and Hillier, 2000; Cole and McCullough, 2008). Within the United States, Vermont, Utah and, more recently, Delaware have become popular jurisdictions (Bruner, 2020). Due to the large presence of the insurance and reinsurance industries in these jurisdictions, the captive insurance company has access to a specialized pool of lawyers, accountants, tax advisors, and actuaries and other insurance professionals who are able to identify and pool various risks to which different group entities are exposed. Such specialized staff and advisors are necessary to comply with transfer pricing regulations governing related party transactions. These transactions require the premium payments made by group entities to the captive insurance entity to be priced according to insurance industry standards at prevailing third-party market prices for the insured risks.

An additional tax benefit of captive insurance usage is related to the transfer pricing of the related party transactions among group entities that are paying premiums to the captive insurance entity (OECD, 2020). Captive insurance is often popular for insuring hard-to-price risks, such as cyber insurance, terrorism and political conflict insurance, and director and officer ("D&O") insurance (Bruner, 2020; LaCroix, 2022; Lesourd and Schilizzi, 2011). These types of risk make captive insurance particularly appealing for a few reasons. First, the large premium prices charged on the open market may not be attractive to a firm, and, therefore, self-insurance is generally more cost-effective. The second reason involves an additional tax benefit of captive usage related to transfer pricing, which allows the firm to charge the very large market rate for such contracts to related entities. These entities then pay large premiums out of pre-tax revenue to the captive insurance entity, which is able to justify the high premiums with similar third-party quotations, resulting in greater group profits in the jurisdiction of the captive insurance entity, which is most often a low-tax jurisdiction.

6.2.2 Captive insurance as risk management

Prior studies have established the extent to which firms engage in risk management. A central insight from this theoretical literature is that firms commonly face market imperfections that lead to a situation in which a firm can improve value by managing risk through insurance or hedging. Hedging and insurance are, in many ways, substitutes for managing risk. The costs of insurance equate with the costs of hedging activities, and the insurance company equates with hedging counterparties. For hedging, which requires funds, transaction costs include the labor and management costs of devising and managing a company's hedging policy, as well as the transaction costs in terms of broker fees and bid-asks spreads associated with trading the necessary hedging instruments. For insurance companies, transaction costs cover the companies' operational costs and cost of capital.

The capital asset pricing model (CAPM) identifies two types of risk—systemic and firm-specific. Systemic risks cannot be diversified and affect every asset proportionately to the asset's covariance with the market (i.e., the beta term in the CAPM). The implication for investors is that they can diversify away firm-specific risk by constructing a diversified portfolio in which the covariance of firm-specific risks approaches zero. (Sharpe, 1964; Lintner, 1965). Since investors can diversify risks in this way, firm expenditures on any type of risk management, hedging, insurance, or captive insurance should yield to decreases in shareholder value.

A firm may try to insure firm-specific risks, and an insurance seller agrees to sell such a contract if it can diversify that risk by underwriting uncorrelated firm-specific risks of other firms. If the firm is able to purchase the insurance contract at the expected loss, then the value of the firm remains unchanged. However, given positive transaction costs, an insurance seller would be unwilling to sell a contract at this price, as it would need to cover its own operational costs. If a firm tries to buy a contract to insure firm-specific risks for more than the expected value of losses from this risk, then this would not add any additional value for investors since they diversify firm-specific risks through a diversified portfolio. Therefore, attempts by the firm to insure, hedge, or otherwise manage firm-specific risks with positive transaction costs would result in decreased firm value.

It may be beneficial for a firm to buy insurance against systemic risks since investors cannot diversify away such risks (Doherty, 1997). However, since the systemic risks faced by the firms are, by definition, correlated, an insurance company cannot create a portfolio of policies underwriting systemic risk where the risks are uncorrelated. The risks are simply transferred from firms to the insurance company, and since the risks are correlated and additive, the insurance company cannot reduce its exposure through pooling and diversification as it would with uncorrelated risks.

However, given market imperfections, there are several ways that risk management can help firms increase value, given positive transactions costs (Froot et al., 1993). The risk-management literature indicates that hedging and insurance can be beneficial to firms by decreasing costs of financial distress and, thus, decreasing firms' borrowing costs and effective marginal tax rate and allowing the company to commit more money to regular dividends and investment expenses. I consider these arguments in turn.

6.2.3 Costs of financial distress

In the absence of bankruptcy costs, a solvent firm should find it equally costly to cover a loss by receiving an insurance claim payout, realizing the gain from a hedging contract, or raising additional funds from capital market sources (Modigliani and Miller, 1958; Bessembinder, 1991; Main, 1982). However, investors consider the positive expected costs of financial distress when they invest in the debt or equity of a firm. These include potential costs arising from a bankruptcy procedure (Warner, 1977; Weiss, 1990; Altman, 1984), as well as the value of the implicit call option on the firm's assets held by equity holders and written by the firm's debtholders (Black and Scholes, 1973). The nature of this call option on the firm's assets also means that there is the potential for a conflict of interest between equity and debtholders, with equity holders preferring that the firm undertake riskier investments since this will increase the volatility value of the implicit call option held by equity holders (Black and Scholes, 1973; Jensen and Meckling, 1976; Galai and Masulis, 1976). However, depending on the relative influence of debtholders vis-a-vis equity holders, the opposite can also happen, and firms may underinvest in order to ensure their ability to meet obligations to debtholders (Myers, 1977; Bessembinder, 1991). Insurance can reduce these costs of financial distress.

Captive insurance can decrease a firm's borrowing costs in three different ways. The first is based on the fact that a firm utilizing captive insurance has higher levels of assets on its balance sheet from premium payments made by operating entities. In the event of financial distress, this means more assets are available to be liquidated in order to cover debtholders' claims.

Second, insurance helps to smooth the volatility of cash flows over time. Profits in profitable years are reduced slightly to pay for insurance premiums, and losses are reduced in years in which loss-occurring events take place due to the payment of insurance claims against those losses. Froot et al. (1993) find that positive firm expenditures on risk-management practices, including hedging and insurance, can decrease borrowing costs by resulting in decreased volatility and, consequently, higher predictability of cash flows to repay debtholders.

Third, Smith and Stulz (1985) and Bessembinder (1991) find that the smoothing of cash flows over time leads to a reduction in the conflicts of interest between debtholders and equity holders thanks to the decreased volatility of the firm's expected returns. Using the logic of options pricing, the decreased volatility of firm earnings reduces the value of the implicit call option on the firm's assets held by equity holders. This means that equity holders are less incentivized to influence the firm to pursue riskier investment opportunities (Black and Scholes, 1973). The result is that debtholders are more likely to be repaid in full. This suggests an initial baseline hypothesis on the effect of captive insurance on borrowing costs.

Hypothesis 1: Firms using captive insurance structures are able to reduce their short-term borrowing costs thanks to lower costs of financial distress.

6.2.4 Taxes

Tax effects are postulated as a market imperfection that can create conditions whereby firms are potentially able to increase firm value through risk management even when positive transaction costs exist. There are several mechanisms by which hedging or insurance transactions result in a lower effective marginal tax rate for a firm. By purchasing insurance, a firm can realize several potential tax advantages. The first advantage comes from the

classification of insurance premiums as an operating expense. This means that the purchase of insurance, regardless of whether it is from a third party or a captive insurance entity, is made with a firm's pre-tax income. Therefore, purchasing insurance is more tax-advantageous for a firm than self-insuring by setting aside provisions for losses, which would need to be taken from post-tax income (Main, 1982, 1983).

The second potential tax benefit from insurance or hedging results from the ability of firms with volatile earnings to smooth their profits and losses over time. While losses can often be carried forward or carried back in order to be deducted from a firm's profits in other years, most tax codes limit the amount of time such losses can be carried forward. By purchasing insurance, a firm does not have to worry about the ability to carry forward or carry back losses arising from events that can, instead, be insured. In this second scenario, the firm pays insurance premiums to cover the possibility of a loss-creating event. In years in which such an event does not occur, the insurance premiums reduce the firm's profits; however, when a loss-creating event does occur in a profitable year, the firm receives payouts from insurance claims to reduce losses in years in which the insured loss-creating event has occurred. A firm would, theoretically, be willing to pay a premium for this insurance above the expected loss, equal to the present-discounted value of the tax benefits it would be able to receive from carry-forward or carry-back losses, plus the additional benefit accruing from not having to worry about the expiration of such losses (Main, 1982).

The third tax benefit is that the ability of hedging or insurance to smooth a firm's earnings over time can allow companies facing a convex tax function to lower their effective tax rates. A convex tax function, as in the case of a progressive tax regime, means that firms pay a higher effective tax rate for higher levels of annual earnings. By reducing profits in years in which no losses occur through insurance premiums, firms are able to realize a lower effective tax rate and yet still reap the other benefits of having insurance for certain loss-creating events. In the case of captive insurance, the benefit is potentially greater because the firm's own captive insurance entity is investing the paid-in premiums and earning profits on the invested capital, which also accrue to the consolidated firm. Graham and Rogers (2002) and Graham and Smith (1999) find that companies facing a convex tax function are able to lower their effective tax rates by using hedging to reduce earnings volatility over time.

A fourth potential benefit can also accrue from the use of insurance. As discussed in the section on costs of financial distress, a firm can lower its costs of financial distress by purchasing insurance. Facing a lower cost of financial distress, a firm is able to rebalance its capital structure and increase its leverage in such a way as to further exploit the tax-deductible benefit of interest payments (Graham and Rogers, 2002; van Binsbergen et al., 2010). The discussion above suggests:

Hypothesis 2: Captive insurance usage by firms allows firms to take advantage of tax effects resulting in lower effective marginal tax rates.

6.2.5 Dividends and Investments

Cash flow variability can lead to variability in expenditures, and, therefore, firms expecting high variability in cash flows would be reluctant to commit to regular expenditures. Since many firms use regular dividends or stock buybacks to signal investors (Ofer and Siegel, 1987; Comment and Jarrell, 1991; Healy and Palepu, 1988) or to cater to a specific clientele of investors (Graham and Kumar, 2006; Baker et al., 2007; Shefrin and Statman, 1984), firms tend to commit to a level of dividends that they are comfortable maintaining over time. The use of insurance or hedging to reduce cash flow variability enables firms to commit to higher levels of regular expenditures on dividends and share buybacks (Froot et al., 1993; Lessard, 1991; Smith and Stulz, 1985). These findings and theories suggest:

Hypothesis 3: Firms using captive insurance structures are able to commit to higher levels of expenditures on dividends.

The argument that risk-management methods such as hedging and insurance can help ensure that firms make cash flow commitments resulting in higher expenditures on dividends and share buybacks has also been applied to expenditures on intangible asset development, under the assumption that most R&D projects are long-term and require consistent, ongoing payments (Geczy et al., 1997; Lewent and Kearney, 1990). As a result, it is likely that:

Hypothesis 4: Firms using captive insurance spend more on intangible asset development.

6.2.6 Governance Motives

Smith and Stulz (1985) present the case that managers with a large share of their personal wealth invested in a firm are likely more motivated to reduce firm risk than the average shareholders, who can diversify risk across their portfolios. This invested wealth can take the form of existing shareholdings (possibly paid out previously as stock compensation), a large proportion of annual salary paid out as stock-based compensation, or simply a large total salary package, as this implies that the manager has a large amount of human capital invested in the firm as the present discounted value of future earnings.

Several empirical studies find that firms are more likely to hedge when they pay executives more stock compensation and less likely when they pay more options compensation (see, for example, Tufano 1996; Geczy et al. 1997; Knopf et al., 2002). The idea is that managers are motivated to hedge when they are more invested in the firm; the firm is assuming hedging costs, and since executives receive a large portion of their wealth in stock, they would find it difficult to otherwise diversify this away. Options compensation would motivate less hedging since hedging decreases firm volatility and, consequently, share price volatility. The decreased share price volatility would result in options on the firm's stock being less valuable. Thus, I propose the following two hypotheses:

Hypothesis 5a: High overall levels of compensation, as well as high levels of stock compensation, are positively correlated with captive insurance usage since this means that executives have a large proportion of their wealth in the form of human capital (i.e., the present discounted value of future earnings) invested in a single firm.

Hypothesis 5b: Higher levels of options compensation are more likely to be negatively correlated with captive insurance usage since managers would be disincentivized to reduce the firm's share price volatility since the value of their options would decrease.

Rebello (1995) and Huberman (1997) argue that managers may use hedging to signal firm quality to the market, thereby increasing their own prestige as well. However, in some cases, this can lead to a situation in which managers might use hedging or some form of risk management. Though their use of risk management would be detrimental to the firm, they would do so in order to increase their own prestige at the expense of overall firm value.

Scordis and Porat (1998) argue that establishing a captive insurance entity can also be a way for managers to increase their stature, and they find evidence that firms with heightened manager-owner conflicts are more likely to operate captive insurance entities. Again, this may lead managers to form captive insurance entities when the benefits to their particular firm do not outweigh the costs of establishing a captive insurance entity.

With respect to institutional ownership characteristics, we consider two competing hypotheses. On the one hand, investors with large holdings would have both the incentives to actively monitor firm behavior and the means, through increased voting power, to ensure that firms avoid excessive risk taking. This would also lead to the prevention of captive insurance structures if they were value-destroying and were being pursued for the private benefit of blockholders or management. If, however, such structures are value-enhancing, then the interests of management and shareholders would be aligned. On the other hand, large institutional investors may assume a more passive role, in part because monitoring costs and the free-rider problem would lead to a failure of collective action. Similarly, when we examine the influence of ownership concentration and large blockholders, we must also consider two competing effects. Concentrated ownership could result in blockholders using their influence to pursue private benefits to the detriment of total firm value. However, high ownership concentration could lead to more-efficient monitoring, which could benefit all shareholders, not just blockholders (Barclay and Holderness, 1989; Shleifer and Vishny, 1986; Black, 1990; Karpoff et al., 1996; Agrawal and Knoeber, 1996; Huddart, 1993; Maug, 1998).

The presence of large, outside blockholders can also have conflicting effects. If the hedging or captive insurance is likely to be value-creating because of the financial benefit of increasing firm value (as discussed in the financial benefits sections above), then blockholders would be motivated to advocate its implementation. The reason is that there would be alignment between (1) the private benefits they would receive since they would not be able to diversify their large holding stake as cheaply as average shareholders could and (2) the increases in firm value from the hedging or captive insurance usage. These motives also align with those of management, who are, through their holdings and compensation packages, heavily invested in the firm. This illustrates how captive insurance as a form of risk management can help to align managerial and shareholder motives and mitigate managerial

conflicts (Hartzell and Starks, 2003). However, if the private benefits hypothesis dominates for the blockholders, and their interests conflict with the goal of increased total firm value, then they may prevent firms from engaging in value-creating risk management, be it hedging policies or captive insurance formation (see, for example, Smith and Stulz, 1995; Tufano, 1998; Breeden and Viswanathan 2015). Thus, I expect that:

Hypothesis 6: Insider holdings and holdings by institutional blockholders are positively correlated with captive insurance usage, as executives and large shareholders would prefer firms to hedge because their ability to diversify portfolio risk may be more limited due to the large investments in a single firm. Despite the possibility that blockholders may be more motivated to seek private benefits than to increase overall firm value, these interests are likely to align in the case of captive insurance usage.

6.3 Data and Methodology

This section describes the data and methodology employed to test my hypotheses regarding firms' captive insurance usage.

6.3.1 Data

The sample used in this study consists of a panel dataset consisting of non-financial companies with primary securities listed on equity exchanges in the United States over the period of 2009-2016. I screen in Compustat for non-financial companies with assets over 500m and a market cap over 500m. To screen for industry, I use the Global Industry Classification Standard (GICS) developed by MSCI and Standard & Poor's (S&P) (S&P 2018) and filter out any companies belonging to the GICS sector "financials" (GICS sector code 40).

I then add-in annual financial accounting data from Compustat. From Bloomberg, I access measures of firm borrowing costs, as well as insider holdings data and executive compensation data. Institutional holdings data drawn from 13F filings are from the Refinitiv (formerly Thomson Reuters) database on Institutional Holdings. Any investment manager

with at least USD 100 million in assets under management is required to file form 13F with the SEC, listing their equity ownership stakes (17 CFR § 240.13f-1). In addition to key indicators of firm financial data from Compustat, the panel data are complemented with effective marginal income tax rates based on the methodology employed by Blouin et al. (2010) and weighted average annual borrowing costs on short-term debt. The data used to calculate the effective marginal tax rates are also from Compustat. Then I remove any firm-year observations for which there are any missing values.

A keyword search through SEC filings, along with a manual review, has allowed me to flag firms in the dataset that employ captive insurance structures. For each firm and each year, I code a dummy variable indicating whether or not a firm utilizes a captive insurance structure in that year. A value of 1 indicates that a firm uses captive insurance, based on keyword searches of SEC filings and manual screenings, and a value of 0 indicates that no evidence of captive insurance usage has been found. Additionally, for firms in the dataset using a captive insurance structure, I create a variable denoting how long, in years, the firm has been using captive insurance. For those firm-year observations in which the firm later uses captive insurance, I allow this variable to take negative values indicating the number of years before a captive insurance structure is formed.

Finally, year and industry dummy variables are generated to control for year and industry effects. Table 1 describes all the variables included in the analysis. Summary statistics for all variables are presented in Table 2.

Summary characteristics of the dataset and a discussion of general trends of captive insurance usage are presented in Table 3. Over time, more and more firms are using captive insurance across all industries. Panel B in Table 3 shows the number of company observations for each year in the dataset and the percentage of companies using captive insurance in each year. For firms in the dataset that do implement captive insurance structures at some point over the 2009-2016 observation period, Panel C shows the years of captive insurance formation and the number of firms forming captive insurance structures in each year. Panel D shows a snapshot of captive insurance usage by industry, revealing a general trend of usage across all non-financial industry sectors.

There is a high correlation of captive insurance usage with firm size, whereby larger firms are more likely to use captive insurance. Panel E illustrates that the likelihood of a firm using captive insurance structures increases with the firm's market capitalization. There are two key explanations for this likelihood. First, there are economies of scale—the costs of setting up and managing captive insurance subsidiaries make the structure more cost-efficient for larger firms, which already have many subsidiaries and employ legal and tax advisory firms that focus on such large corporate structures (Bruner, 2020). This means that for very large firms, the benefits of establishing and managing a captive insurance structure exceed the costs. Second, this may also indicate a herd mentality, whereby the advisors of large multinational firms attempt to sell captive structures to all of their clients (Adams and Hillier, 2000). For instance, most major accounting and corporate law firms have specialized practices focusing on the setup and management of captive insurance entities.

6.3.2 Methodology

In order to test the relationships between captive insurance and the four financial variables it is intended to impact—borrowing costs, tax rates, dividends, and expenditures on intangible asset development—ordinary least squares (OLS) models are used to regress on these financial variables as the dependent variables. To test the effect of captive insurance usage, a dummy variable is used to indicate whether the firm is using captive insurance in the current year. This variable is then replaced with a variable indicating how long the firm has used captive insurance or, in the case of negative values for this variable, how long it will be before the firm uses it.

In all of the models, I control for size using the natural logarithm of assets, profitability using return on assets (ROA), leverage using the ratio of total debt to assets, and the value of intangible assets by using Tobin's Q. For certain models, additional control variables are used as appropriate, and these are discussed in the context of each analysis below. In order to control for year and industry effects, dummy variables are used for years and for each GICS industrial sector classification.

To test the robustness of my models, I use several strategies. I use two sets of models—a combined set with all observations and a set with only companies that used captive insurance

structures at some point over the 2009-2016 period. I repeat the same regression with the captive use flag (indicating if the firm is using a captive insurance structure in the current year) for both sets. The addition of the second model allows me to compare the before and after effect of company-year observations where the firm is currently using captive insurance with company-year observations where the firm will at some later point adopt a captive insurance structure. This helps to ensure that the use of captive insurance is not simply coincidental with other firm characteristics exogenous to the model, which are affecting the dependent financial variables.

Then I rerun the regression on the subset of companies that used captives at some point over the 2009-2016 period, replacing the captive use flag with the variable that indicates how long the firm has been using captive insurance; and for firms that are not currently using captive insurance, this variable takes a negative value that indicates the number of years before the firm will begin using captive insurance. In addition to serving as a robustness check, this model considers whether the amount of time before and after captive insurance usage has an impact on the dependent financial variable.

In order to investigate the link between governance and captive insurance usage, I use logit models in which the dependent variable is the dummy variable that indicates whether or not the firm is using captive insurance in the current year. The dependent variables are data on executive compensation: the natural logarithm of total executive compensation; the ratio of stock compensation to total executive compensation; and the ratio of options compensation to total executive compensation. Control variables are used for firm size (the natural logarithm of total assets), profitability (ROA), leverage (total debt to assets), and tangibility (Tobin's Q). Dummy variables are used to control for year and industry effects.

The logit model is first run on the entire dataset and then repeated for the subset of company-year observations for firms that used captive insurance at some point during the 2009-2016 period. Then, a third model is run: this is an OLS regression using the same subset of companies as the second model, but the dependent variable is replaced with the variable indicating the number of years since the firm began using captive insurance or, for firms that have not yet begun using captive insurance, a negative value indicating how many years it will be before the firm forms a captive insurance entity.

The three regression models featuring executive compensation variables are then repeated, replacing the executive compensation variables with variables on ownership characteristics: the total proportion of shares owned by institutional investors; the proportion of shares owned by blockholders; and the proportion of shares held by insiders.

Finally, two additional sets of models are created to test the relative importance of the governance and financial variables I have examined. First, the three models are repeated again, combining all executive compensation and ownership variables in order to test the robustness of the results and compare the relative strength across these three variables. Second, these models are repeated, and all governance variables are replaced with the financial variables tested previously: borrowing costs; marginal tax rate; dividends; and expenditures on intangible asset development. These two models allow for comparisons between the financial and governance aspects of captive insurance usage in order to examine which factors are more influential.

6.4 Results

This section contains further details on the construction of the econometric models. I begin with a brief overview of the factors influencing each of the dependent variables based on a review of the relevant theoretical and empirical literature. The literature has influenced the selection of explanatory and control variables used to construct my models. I include these variables in my models in order to control for other effects on the dependent variable besides captive insurance usage. I then present the results of my tests with respect to each dependent variable.

6.4.1 Borrowing costs

Using insurance can affect a firm's debt capacity and help lower its borrowing costs (Adams and Zou, 2008). Captive insurance offers an interesting setting in which to examine the effect of its usage on a firm's cost of debt. The dependent variable is sourced from Bloomberg and measures the after-tax weighted average cost of debt for the firm's debt securities as a spread

over the risk-free rate (the ten-year government bond rate in this case). The cost of debt field is calculated using government bond rates of corresponding maturities, a debt adjustment factor, the proportions of short- and long-term debt to total debt, and the firm's effective tax rate (Bloomberg Financial Terminal). The independent variable of greatest interest is a dummy variable indicating whether or not the firm uses a captive insurance structure; in the third model variant run on the subset of companies that use captive insurance at some point over the 2009-2016 period, this variable is replaced by a variable indicating how long a firm has used captive insurance structures or how long it will be before a captive structure is adopted, in which case the variable takes a negative value. The control variables are chosen based on the theoretical literature on costs of financial distress and are similar to those used in empirical studies of borrowing costs by Altman (1968), Begley et al. (1996), and García-Teruel and Martínez-Solano (2007).

Firm size affects borrowing costs because the level of asymmetric information between borrowers and lenders is generally higher for smaller firms, making it more costly for lenders to assess their credit quality (Berger and Udell, 1998). Smaller firms also tend to have less access to capital markets and correspondingly less pricing power in negotiating borrowing rates (Titman and Wessels, 1988). Because these factors generally increase borrowing costs for smaller firms, I control for firm size by using the natural logarithm of total assets as a control variable.

I include the current ratio (current assets divided by current liabilities) in the models examining borrowing costs. The current ratio is often used in the empirical literature as one indicator of a firm's ability to repay its debt obligations. This also serves as one proxy for a firm's costs of financial distress. Firms with a higher current ratio have a higher level of current assets available to cover current liabilities. This means that a lender should be more easily able to liquidate current assets in order to cover unpaid liabilities; therefore, the costs of financial distress are lower when the current ratio is higher.

Since a firm's costs of financial distress are also higher when there is greater overall leverage due to conflicts of interest between equity and debtholders, I incorporate the leverage measures of total debt to assets as a control variable for leverage in my analyses. I use Tobin's Q ratio of the market value of a firm's equity and debt to the book value of firm

assets in order to control for effects from firms that have large levels of internally developed intangible assets, significant unrecognized appreciation of assets, or other indicators of high growth; all of these affect a firm's ability to increase leverage.

I include the ratio of short-term to total debt as a controlling variable for several important reasons. Myers (1977) and Leland and Toft (1996) find that longer-term debt increases conflicts of interest between shareholders and debtholders less than short-term debt does. Therefore, a greater proportion of short-term debt can reduce these conflicts of interest and lead to lower costs of financial distress while maintaining the same level of overall leverage. Additionally, Diamond (1991) argues that a firm's choice between short-term and long-term debt depends on credit ratings, access to capital markets, and information asymmetries. Therefore, the inclusion of the short-term to total debt ratio helps to control for these factors.

The levels of the risk-free rate, inflation and other macroeconomic factors are also important variables to consider in analyzing short-term borrowing costs (Walker, 2010). However, since these variables affect all firms at the same time, the use of year dummies in my regression models mean that such common, time-dependent fixed-effects are already controlled for in the regression models.

The results of my models testing the impact of captive insurance usage on short-term borrowing costs are reported in Table 4. To this end, the results of the three model variations confirm my hypothesis that captive insurance decreases costs of financial distress by indicating a strong relationship between captive insurance usage by firms and decreased borrowing costs. Model 3, which considers how long a firm has been using captive insurance, confirms the effects and indicates that the decrease in borrowing costs after a firm adopts a captive insurance structure continues slightly over time.

The signs of the effects of the other independent and control variables on borrowing costs are largely consistent with the theoretical predictions discussed above. Larger firms, as measured by the natural logarithm of total assets, enjoy decreased borrowing costs. Higher levels of intangible assets (measured by Tobin's Q) are correlated with lower borrowing costs. The relationship between the proportion of short-term debt to total debt and borrowing costs is negative across my models. This is consistent with the arguments of Myers (1977) and

Leland and Toft (1996) that higher proportions of short-term debt reduce costly conflicts between debt and equity holders since the frequent rollover of short-term debts provides debtholders with a greater voice. However, this may also be related to Diamond's (1991) argument that a firm's preference for short-term versus long-term debt is parabolically related to its credit quality. Diamond (1991) finds that high-credit-quality firms will find it relatively cheaper to borrow short-term debt, but poor-quality firms will have access only to expensive short-term debt.

My results are consistent with the empirical literature on the effects of hedging on borrowing costs and demonstrate that captive insurance usage yields similar results to hedging on firm borrowing costs. Geczy et al. (1997) find that firms using currency derivatives for hedging have lower borrowing costs, and an analysis by Haushalter (2000) indicates that firms with more-extensive hedging policies generally have lower costs of debt.

6.4.2 Marginal Tax Rates

Taxes are perennially a market imperfection and play an important role in capital structure determination because of the tax deductibility of interest payments. This tax deductibility makes debt financing relatively cheaper than equity financing and allows firms to take advantage of the tax benefit of debt financing to increase leverage. Of course, this will continue only up to the point where the costs of increased leverage—in terms of costs of financial distress and conflicts of interest between debtholders and shareholders—begin to outweigh the benefits of the interest tax deduction (Modigliani and Miller, 1958; DeAngelo and Masulis, 1980; Leland, 1994; Graham, 2000; Leland and Toft, 1996).

In order to test whether captive insurance helps companies lower their effective tax rates, I model the effect of captive insurance usage on effective marginal tax rates, which, in my dataset, reflect the effective marginal tax rate faced by the firm after considering the firm's interest rate deduction benefits. Data on tax rates are from the Wharton Research Data Service (WRDS) Marginal Tax Rates Database. This database uses firm-level data from Compustat and a methodology developed by Blouin et al. (2010).

As discussed above, the theoretical and empirical literature suggests that a company's capital structure decision is directly related to the firm's effective tax rate because of the taxdeductibility of interest payments (Modigliani and Miller, 1958; DeAngelo and Masulis, 1980; Leland, 1994; Graham, 2000; Leland and Toft, 1996). Therefore, I use the leverage calculations of total debt to assets in order to control for this effect of leverage on tax rates. Leland and Toft (1996) further show that long-term debt, as compared to short-term debt, allows companies to exploit greater tax benefits; however, Diamond (1991) argues that firms with better credit quality prefer short-term to long-term debt because it is relatively cheaper. If firms with higher absolute profits have better credit quality along with higher tax rates, they face a tradeoff between the additional tax savings of long-term debt and cheaper short-term debt. For this reason, I also include the ratio of short-term debt to total debt to control for these effects.

Previous empirical studies on firms' tax rates have controlled for the effects of a firm's level of investment tax credits (ITC) (Graham and Smith, 1999; Graham, 2000; Graham and Rogers, 2002; Blouin et al., 2010). I also use the level of investment tax credits scaled by assets as a controlling independent variable. To control for firm size, I use log assets, and to control for the absolute level of profits, I use the log of net earnings.

Table 5 presents the results of my models. In all the model variations, I find that firms utilizing captive insurance tend to have a lower marginal tax rate. While model 3 shows that there is a statistically significant negative effect related to the length of time a company has used captive insurance, the magnitude of this effect is minimal. Nonetheless, this model variant helps to confirm the role of captive insurance in helping firms lower their effective tax rates.

The results for firm size, measured by the natural logarithm of assets, indicate a negative relationship between firm size and effective tax rates. This may be because larger firms have greater access to tax advisers, lawyers and lobbyists, along with the political clout to find and take advantage of as many tax benefits as possible in pursuit of a lower overall tax bill. As can be seen when considering the relationship between marginal tax rates and total level of firm profits, measured by the natural logarithm of net income, firms with higher absolute levels of profits tend to pay higher marginal tax rates. The positive relationship between

profit and tax rates indicates, consistent with the empirical findings of Graham and Smith (1999), that most firms tend to face a convex tax function, suggesting an overall progressive nature of the corporate tax system.

My models indicate that a higher degree of leverage is correlated with lower tax rates, even when controlling for the proportion of short-term debt. The level of investment tax credits seems to be negatively correlated with the marginal tax rate, although the statistical significance is not consistent across model variants. This negative relationship likely exists because the firms that are in a position to take greatest advantage of investment tax credits are generally operating in industries that rely on high levels of research and development expenditures (Blouin et al., 2010). Furthermore, firms that have accumulated high levels of R&D credits are likely to have high levels of intangible assets (O'Brien, 2003). However, in the models that consider only the subset of companies that use or will use captives, the level of investment tax credits becomes irrelevant. This may indicate that, to some extent, a firm that has limited access to other means of reducing its tax rate may use captive insurance as a substitute.

In general, the results of my models provide strong support for my hypothesis that firms are able to decrease their effective tax rates through captive insurance usage. Furthermore, companies enjoy a lower tax bill once they adopt a captive insurance structure, and this benefit continues, albeit modestly, over time. These results support the tax-saving motivation for using captive insurance and is consistent with the empirical literature on the tax-saving benefits of hedging as a risk-management technique (Graham and Rogers, 2002; Graham and Smith, 1999).

6.4.3 Dividends

Modigliani and Miller (1961) argue that, under perfect market conditions, investors should be indifferent about how a firm pays out profits. Regardless of whether a firm pays out earnings through dividends or share repurchases, the money is redistributed to shareholders. Even if a firm does not return earnings to investors, as long as the firm continues to invest in projects that will earn the firm's equity cost of capital, the firm's market capitalization will increase

by the amount of the earnings, and investors can simply sell some appreciated shares in order to convert some of the firm's profits into cash.

When examining a firm's payout policy, it is essential to control for a firm's asset level, level of intangible assets, and leverage. If a firm decides to increase payouts by reducing investments in intangible assets or selling assets, then the opportunity cost of the forgone investments or decrease in firm assets has an effect on shareholder value. Similarly, if a firm increases its borrowing to pay dividends, the change in the firm's leverage affects shareholder value. (Modigliani and Miller, 1961; Lintner, 1962).

In order to test the relationship between captive insurance usage and a firm's payouts to shareholders, I use OLS models in which the dependent variable is the sum of all dividend payments and share repurchases, scaled by total assets. This includes dividends paid in cash or in shares. Dummy variables for both year and industry are used to control for year and industry effects. As a control for firm size, I use the natural logarithm of total assets. To control for leverage effects, I use the ratio of a firm's total debt to assets as a control variable. Return on Assets (ROA) is used to control for the level of profitability. In order to control for the effects of firm investments in intangible assets, as well as for the value of internally developed intangible assets that do not appear on the balance sheet, I use Tobin's Q ratio as a control variable. This is consistent with similar empirical studies (O'Brien, 2003; Geczy et al., 1997).

The results of the regressions on dividends in Table 6 show strong evidence supporting a positive relationship between expenditures on dividends and share repurchases and captive insurance usage. The years-of-captive-use variable in model 3 illustrates that the benefit of using captive insurance is statistically significant not only before and after a captive insurance structure is employed, but also in the time before and after a firm begins using captive insurance.

The results of the above analyses are consistent with the empirical literature on the relationship between dividends and hedging. Nance et al. (1993) find a positive relationship between hedging and dividend payouts. In contrast, Haushalter (2000) finds that firms with hedging programs are more likely to have lower dividend payouts. However, Haushalter's

study focuses on hedging policies in industries (oil and gas producers) in which liquidity is important; and, for these firms, high dividend payouts may act as a substitute for hedging since dividends can be decreased to increase liquidity if necessary.

6.4.4 Investments

The argument that risk-management methods such as hedging and insurance can help ensure that firms meet their commitments has been used to posit a positive relationship between captive insurance usage and expenditures on dividends and share buybacks, as well as on higher R&D expenditures under the assumption that most R&D projects are long-term and require ongoing payments (Geczy et al., 1997; Lewent and Kearney, 1990). This would suggest that there should be a positive relationship between captive insurance usage and firm expenditures on intangible asset development; and the same would apply to expenditures on advertising, as it is also an investment in intangible assets such as brand value and customer loyalty.

In order to test the relationship between captive insurance usage and a firm's level of investment in intangible asset development, I use OLS regressions on the sum of R&D and advertising expenditures divided by assets as a proxy for a firm's level of investment in internally developing and enhancing intangible assets. To control for the existing level of intangible assets, I use Tobin's Q ratio as a control variable. Additionally, I use the natural logarithm of assets to control for size effects, ROA to control for firm profitability, and the ratio of total debt to assets as a control for leverage. Dummy variables for years and industries are used to control for time and industry effects.

Table 7 shows the results of these regressions, presenting strong evidence of a positive relationship between investments in R&D and advertising and captive insurance usage. The variant of the models on the subsets of companies that used captive insurance at some point during 2009-2016 confirm this result for companies using versus not using captive insurance, as well as for the before and after effect of companies adopting captive insurance usage. These results also support the empirical evidence in Geczy et al. (1997), showing a positive relationship between currency-hedging activities and R&D expenses.

6.4.5 Governance Factors

In order to investigate the impact of corporate governance factors on captive insurance usage, I use logit regression models of governance variables as independent variables and the binary captive use variable as the dependent variable. This logit regression is repeated for the subsample of companies that used captive insurance at some point over the 2009-2016 period. Also with this subsample, I run an OLS regression with the same set of independent variables, with the dependent variable being the number of years the firm has been using captive insurance or the number of years prior to the firm adopting captive insurance. Control variables are used to control for firm size (the natural logarithm of assets), profitability (ROA), leverage (total debt to assets), and the level of intangible assets (Tobin's Q). Year and industry effects are controlled for by using dummy variables for years and GICS industry sectors. Table 8 shows the models examining governance variables. Compensation variables are considered in Panel A and ownership variables in Panel B.

The models on compensation variables show that firms are more likely to utilize captive insurance when they pay higher levels of total executive compensation and higher proportions of that compensation as stock. Furthermore, the models indicate that firms are less likely to hedge when they pay higher options-based compensation, as the decreases in volatility from firm hedging will result in decreased value of options on the firm's securities. The results of model 3 regressing on the years-of-captive-use variable illustrates that as companies adopt captive insurance structures, the proportion of options compensation decreases over time as the proportion of stock compensation increases, even holding the overall level of compensation constant. Relatively speaking, options compensation becomes much less attractive since the captive insurance structure decreases firm volatility, and, consequently, the value of options contracts declines.

The models of ownership variables indicate that firms with higher levels of insider holdings and higher levels of holdings by institutional blockholders are more likely to use captive insurance. Despite the demonstrated statistical significance of the measurement of institutional blockholder ownership, the magnitude of the relationship between insider holdings and captive insurance usage, as well its the statistical significance, is much stronger than that for blockholders. This pattern for insider holdings is also consistent across the three model variations.

The results related to captive insurance usage and compensation and ownership variables are consistent with my hypotheses and with the theoretical and empirical literature on these factors in relation to firms' risk management and hedging activities. Smith and Stulz (1985) argue that firms with high levels of insider shareholdings are more likely to engage in risk-management activities, as the high managerial holdings mean that insiders are not able to diversify their portfolios as cost effectively as the average shareholder and, therefore, disproportionately benefit from the firm engaging in risk-management activities. Institutional blockholders with significant portions of their total portfolio invested in a single firm would similarly find it difficult to hedge more cheaply through portfolio diversification. The argument concerning diversification can be easily extended to compensation variables, as managers paid with higher salaries and higher proportions of stock can be thought of as having their human capital invested in the firm in the form of future earnings. My findings with regards to compensation are consistent with empirical studies on firms' hedging activities (Tufano,1996; Geczy et al., 1997; Knopf et al., 2002).

In order to compare the governance and financial variables, two additional sets of models are created. Panel A of Table 9 shows models combining all compensation and governance variables. Panel B of Table 9 replaces the governance variables with the four financial variables (borrowing costs, marginal tax rates, dividends, and investments in intangible assets) found to be impacted by captive insurance usage. Comparisons across models, considering model fit measures (r-square values), as well as the magnitude and statistical significance of the financial and governance variables (coefficients and p-values), indicate that the governance-related variables are more predictive of captive insurance usage than the financial variables.

6.5 Conclusion

This chapter examines the financial benefits that firms experience through captive insurance usage and the relative importance of financial and governance variables in a firm's decision to adopt captive insurance.

My panel dataset consists of non-financial companies with primary securities listed on equity exchanges in the United States over the period 2009-2016. I find that there is a high correlation between captive insurance usage and firm size. My findings are consistent with the view that the costs of setting up and managing captive insurance subsidiaries make the structure more cost-efficient for larger firms that already have many subsidiaries and employ legal and tax advisory firms that focus on such large corporate structures.

My empirical investigation also looks at whether captive insurance can decrease a firm's costs of financial distress and effective marginal tax rate. Supporting the tax minimization hypothesis, I find that firms using captive insurance tend to have a lower marginal tax rate. My results show that there is a statistically significant negative effect related to the amount of time a company has used captive insurance, though the magnitude of this effect is minimal. This is also consistent with empirical studies showing that corporate hedging can accomplish similar goals.

Supporting the financial hypothesis, this chapter also shows that the ability of firms to meet their expense commitments is associated with their captive insurance usage. In particular, I find strong evidence supporting a positive relationship between expenditures on dividends and share repurchases and the use of captive insurance. Results reveal that the benefit of captive insurance is statistically significant not only before and after a captive insurance structure is employed, but also in the time before and after a firm begins using captive insurance.

In examining the relationship between captive insurance and governance, I show that higher levels of ownership by insiders and blockholders affect a firm's decision to use captive insurance structures. I observe, however, that despite the statistical significance of the measurement of institutional blockholder ownership, the magnitude of the relationship between insider holdings and captive insurance, as well as its statistical significance, is much stronger than that for blockholders.

I also examine the influence of executive compensation levels and the proportions of stock and options compensation on the firm's captive insurance decision. Firms are more likely to utilize captive insurance when they pay higher absolute amounts of total executive

compensation and higher proportions of that compensation as stock. Furthermore, I find that firms are less likely to hedge when they pay higher options-based compensation, as the decreases in volatility from firm hedging will result in decreased value of options on the firms' securities. For companies that adopt captive insurance structures, the proportion of options compensation actually decreases as the proportion of stock compensation increases, even holding the overall level of compensation constant. These findings suggest that options compensation becomes much less attractive since the captive insurance structure decreases firm volatility, and, consequently, the value of options contracts declines. The results are consistent with the theoretical literature on governance and risk management and the empirical literature examining firms' hedging decisions in relation to compensation structures.

This chapter contributes to the literature on captive insurance structures, which has tended to focus on impact of the corporate insurance decision. The results of my analyses link the theoretical literature on risk management to captive insurance usage and add to the empirical literature on firms' hedging practices to include captive insurance usage. In all, the chapter provides direct comparisons between the financial results of captive insurance usage and the governance motives. Thus, by showing that governance-related motives are more important to firms' decisions about adopting captive insurance structures, this chapter has implications for shareholder perspectives on the benefits of forming an in-house risk-financing mechanism.

6.6 Tables

Table 1 - Variable definitions

This table provides definitions, sources and relevant calculations for the variables used in my analyses.

Variable	Definition
total institutional ownership	This is the proportion of a company's shares owned by institutional investors. Institutional holdings data are sourced from Refinitiv (formerly Thomson-Reuters) Institutional Holdings database and are drawn from 13F filings with the SEC. Asset managers with at least USD 100 million in assets under management are required to disclose the securities they manage in 13F filings with the SEC (17 CFR § 240.13f-1). Source: Refinitiv Institutional Holdings Database
blockholder holdings	This is the proportion of a company's shares held by institutional blockholders (i.e., institutional investors with at least a 5% ownership stake). Institutional holdings data are calculated from data sourced from the Refinitiv Institutional Holdings database, which draws from 13F filings with the SEC. Source: Refinitiv Institutional Holdings Database
insider holdings	This variable is used to measure the shareholdings of insiders. Specifically, it is the shares held by executives and non-employee directors. Source: Bloomberg
log assets	I use the natural logarithm of a company's assets in order to control for relative size in the analyses. Source: Compustat.
ROA	As a control variable for company profitability, I use the return on total assets (ROA). ROA is calculated as: Net Income / Total Assets. Source: Compustat
current_ratio	The current ratio is used in models of firm cost of debt. It is calculated as: current assets / current liabilities. Source: Compustat
captive flag	This variable is a dummy variable that takes the value of one if a firm is using a captive insurance structure during the current year. It is determined based on keyword searches and hand screenings of company SEC filings accessed via the Wharton Research Data Services (WRDS) SEC Analytics Suite.
years of captive usage	This variable indicates the number of years since a company began using a captive insurance structure. It can take negative values indicating the number of years before the company adopted a captive insurance structure. It is determined based on keyword searches and hand screenings of company SEC filings accessed via the Wharton Research Data Services (WRDS) SEC Analytics Suite.

log net income	This variable is used in modeling firms' marginal tax rate. It is calculated as the natural logarithm of net income. Source: Compustat
ITC to assets	This variable is used in modeling firms' marginal tax rate. It represents a firm's ratio of investment tax credits to total assets. Source: Compustat
marginal tax rate	This variable approximates the effective marginal tax rate faced by the firm after considering the firm's interest rate deduction benefits. These data are from the Wharton Research Data Service (WRDS) Marginal Tax Rates Database. This dataset uses Compustat data and a methodology developed by Blouin et al. (2010).
Tobins_Q	I use Tobin's Q ratio to control for the level of a firm's intangible assets. It is the ratio of the market value of a firm to the book value of the firm's assets. The ratio is computed as: (Market Capitalization + Total Debt) / Total Assets. Source: Compustat
total debt to assets	In order to control for leverage, I calculate the ratio of total firm debt to total assets. Source: Compustat
short-term to total debt	This variable is used in modeling firms' cost of debt; it is the proportion of the firm's short-term debt to total debt. Source: Compustat
industry	I use industry sector dummies based on the two-digit GICS industry sector codes. Source: Compustat
cost of debt	This field is sourced directly from Bloomberg and is used to approximate firms' borrowing costs. It measures the after-tax weighted average cost of debt for the firm's debt securities as a spread over the risk-free rate (the country's long-term bond rate (10-year)); it is calculated using government bond rates of corresponding maturities, a debt adjustment factor, the proportions of short- and long-term debt to total debt, and the firm's effective tax rate. Source: Bloomberg
log total exec comp	This variable is the natural logarithm of the total value of compensation paid to all company executives. Source: Bloomberg
stock to total comp	This is the ratio of the value of stock-based compensation awarded to company executives to the total compensation paid to all company executives. Source: Bloomberg
options to total comp	This is the ratio of the value of options awarded to company executives to the total compensation paid to company executives. Source: Bloomberg
dividends to assets	This is the ratio of cash and stock dividends, as well as stock buybacks, to total assets. Source: Bloomberg
advertising and R&D expenses to assets	This variable is used to model company investments in intangible asset development. It is the sum of company expenditures on research and development (R&D) and advertising divided by total assets. Source: Compustat

Table 2 – Variable summary statistics

This table presents summary statistics for all variables used in the analyses, with the exception of year and industry dummy variables (n=9349 distinct company-year observations).

Variable	Mean	Minimum	Maximum	Std. Dev.
log assets	8.4614	6.2152	12.9090	1.3163
total debt to assets	0.2890	0.0000	1.6645	0.1889
short-term to total debt	0.0708	0.0000	0.2769	0.1295
current_ratio	2.0471	0.1432	4.3465	1.7786
Tobins_Q	1.7704	0.5930	11.2850	0.8834
ROA	0.0490	-0.0499	0.1488	0.0733
cost of debt	2.4178	0.2256	4.4669	1.1445
captive flag	0.8060	0.0000	1.0000	0.3955
years of captive usage	6.6645	-6.0000	23.0000	6.6826
log net income	5.4775	3.2824	8.1491	1.5268
ITC to assets	0.0002	0.0000	0.0272	0.0015
marginal tax rate	0.3088	0.0000	0.3800	0.0710
dividends to assets	0.0177	0.0000	0.0632	0.0417
advert+R&D to assets	0.0246	0.0000	0.0989	0.0407
log total exec comp	2.7504	1.5769	3.8806	0.7255
stock to total comp	0.3342	0.0000	0.6845	0.1984
options to total comp	0.1400	0.0000	0.4368	0.1524
total institutional ownership	0.8156	0.3756	1.0000	0.1988
blockholder holdings	0.2450	0.0000	1.0000	0.1567
insider holdings	0.0202	0.0000	0.0998	0.0528

Table 3 – Database descriptive statistics

This table presents various descriptive statistics of the dataset. Panel A reports the number of year-company observations and the proportion of these observations in which captive insurances structures are being utilized in the current year for that company, along with the total number of unique companies appearing in the dataset and the proportion of those companies using captive insurance structures in at least one year during the 2009-2016 period. Panel B reports the number of unique companies appearing in the dataset for each year over the 2009-2016 period and the proportion of companies using captive insurance structures in each year. Panel C shows the number of companies in the dataset that formed captive insurance structures during each year. Panel D provides a breakdown by industry of companies appearing in the dataset for 2016, as well as the proportion of companies using captive insurance structures during that year. Panel E provides a breakdown by market capitalization ranges for companies appearing in the dataset for 2016, as well as the proportion of those companies using captive insurance structures during that year.

Panel A

year-company observations	9349
percent using captives in current year	25%
unique companies	1785
percent using captives during 2009-2016	29%

Panel B

year	number of companies	percent using captives
2009	1012	21%
2010	1078	21%
2011	1074	23%
2012	1129	24%
2013	1244	24%
2014	1287	26%
2015	1292	29%
2016	1233	31%

Panel C

year of captive formation	number of companies
1994	13
1995	11
1996	6
1997	19
1998	13
1999	16
2000	10
2001	14
2002	26
2003	17
2004	27
2005	29
2006	18
2007	19
2008	20
2009	12
2010	17
2011	28
2012	27
2013	26
2014	45
2015	57
2016	49

Panel D: Companies by inustry in 2016

Industry	companies	percent using captives
Energy	119	26%
Materials	116	39%
Industrials	260	41%
Consumer discretionary	205	27%
Consumer staples	72	31%
Healthcare	134	36%
IT	198	24%
Communications	62	27%
Utilities	67	25%

Panel E: Companies by market capitalization in 2016

market cap	companies	percent using captives
over 200bn USD	12	58%
10bn to 200bn USD	282	39%
2bn to 10bn USD	532	32%
less than 2bn USD	407	26%

Table 4 – Borrowing costs

This table reports the results of ordinary least squares (OLS) regressions modeling the effect of captive insurance usage on firms' borrowing costs. The dependent variable is the cost of debt measurement provided by Bloomberg. Model 1 includes the entire dataset; Models 3 and 4 use the subset of observations for companies that used captive insurance at some point over the 2009-2016 period. Models 1 and 2 include the captive flag dummy as an independent variable; this is a dummy variable indicating whether the company is using a captive insurance structure in the current year. Model 3 replaces this variable with the years-of-captive-usage variable. This variable indicates the years since the company began using a captive insurance structure; it can take negative values indicating the number of years prior to the company adopting captive insurance. All independent variables are lagged by one year except for the captive flag dummy variable and the years-of-captive-usage variable. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10 percent, **5 percent, and ***1 percent levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: cost of debt			
	1	2	3
const	3.3320***	2.4470***	2.4143***
	(0.2153)	(0.1530)	(0.1505)
log assets	-0.0257***	-0.0505***	-0.0482***
	(0.0073)	(0.0117)	(0.0118)
total debt to assets	1.0421***	1.2531***	1.2425***
	(0.0497)	(0.0852)	(0.0852)
short-term to total debt	-1.8859***	-1.8249***	-1.8202***
	(0.0568)	(0.1107)	(0.1108)
current_ratio	0.0214***	0.0415***	0.0406***
	(0.0064)	(0.0106)	(0.0106)
Tobins_Q	-0.0453***	-0.0665***	-0.0655***
	(0.0086)	(0.0189)	(0.0189)
ROA	-2.0488***	-2.1056***	-2.0946***
	(0.1195)	(0.2205)	(0.2206)
captive flag	-0.0900**	-0.0768*	
	(0.0375)	(0.0437)	
years of captive usage			-0.0063**
			(0.0026)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.4845	0.5079	0.5082

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

Table 5 – Marginal tax rate

This table reports the results of ordinary least squares (OLS) regressions modeling the effect of captive insurance usage on firms' marginal tax rates. The dependent variable is the effective marginal tax rate faced by the firm after accounting for the interest tax shield of debt. It is calculated using the methodology employed by Blouin et al. (2010). Model 1 includes the entire dataset; Models 3 and 4 use the subset of observations for companies that used captive insurance at some point over the 2009-2016 period. Models 1 and 2 include the captive flag dummy as an independent variable; this is a dummy variable indicating whether the company is using a captive insurance structure in the current year. Model 3 replaces this variable with the years-of-captive-usage variable. This variable indicates the years since the company began using a captive insurance structure; it can take negative values indicating the number of years prior to the company adopting a captive insurance structure. All independent variables are lagged by one year except for the captive flag dummy variable and the years-of-captive-usage variable. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10 percent, **5 percent, and ***1 percent levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: marginal tax rate			
	1	2	3
const	0.3521***	0.2935***	0.2907***
	(0.0140)	(0.0118)	(0.0116)
log assets	-0.0089***	-0.0079***	-0.0079***
	(0.0010)	(0.0015)	(0.0015)
total debt to assets	-0.0607***	-0.0391***	-0.0400***
	(0.0038)	(0.0066)	(0.0067)
short-term to total debt	-0.0024	0.0024	0.0027
	(0.0043)	(0.0081)	(0.0081)
log net income	0.0148***	0.0146***	0.0148***
	(0.0008)	(0.0013)	(0.0013)
ITC to assets	-1.6246***	-0.0834	-0.1143
	(0.3783)	(0.3563)	(0.3568)
captive flag	-0.0023**	-0.0056**	
	(0.0009)	(0.0028)	
years of captive usage			-0.0003**
			(0.0002)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.1993	0.2053	0.2053

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

Table 6 - Dividends

This table reports the results of ordinary least squares (OLS) regressions modeling the effect of captive insurance usage on firms' expenditures on dividends and share repurchases. The dependent variable is the sum of cash and stock dividends, as well as share repurchases scaled by assets. Model 1 includes the entire dataset; Models 3 and 4 use the subset of observations for companies that used captive insurance at some point over the 2009-2016 period. Models 1 and 2 include the captive flag dummy as an independent variable; this is a dummy variable indicating whether the company is using a captive insurance structure in the current year. Model 3 replaces this variable with the years-of-captive-usage variable. This variable indicates the years since the company began using a captive insurance structure; it can take negative values indicating the number of years prior to the company adopting a captive insurance structure. All independent variables are lagged by one year except for the captive flag dummy variable and the years-of-captive-usage variable. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10 percent, **5 percent, and ***1 percent levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: dividends to assets			
	1	2	3
const	0.0409***	0.0094	0.0082
	(0.0106)	(0.0106)	(0.0103)
log assets	-0.0020***	-0.0027***	-0.0026***
	(0.0004)	(0.0008)	(0.0008)
total debt to assets	0.0208***	0.0157**	0.0148**
	(0.0030)	(0.0070)	(0.0071)
Tobins_Q	0.0140***	0.0209***	0.0209***
	(0.0007)	(0.0016)	(0.0016)
ROA	0.1069***	0.0689***	0.0692***
	(0.0098)	(0.0204)	(0.0204)
captive flag	0.0029**	0.0070***	
	(0.0014)	(0.0021)	
years of captive usage			0.0008***
			(0.0003)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.2181	0.1947	0.1952

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

Table 7 – Investments

This table reports the results of ordinary least squares (OLS) regressions modeling the effect of captive insurance usage on firms' investments in intangible asset development. The dependent variable is the sum of the firms' expenditures on advertising and research and development (R&D) scaled by assets. Model 1 includes the entire dataset; Models 3 and 4 use the subset of observations for companies that used captive insurance at some point over the 2009-2016 period. Models 1 and 2 include the captive flag dummy as an independent variable; this is a dummy variable indicating whether the company is using a captive insurance structure in the current year. Model 3 replaces this variable with the years-of-captive-usage variable. This variable indicates the years since the company began using a captive insurance structure; it can take negative values indicating the number of years prior to the company adopting a captive insurance structure. All independent variables are lagged by one year except for the captive flag dummy variable and the years-of-captive-usage variable. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10 percent, **5 percent, and ***1 percent levels. Definitions of all variables along with relevant calculations appear in Table 1.

Dependent variable: advertising and R&D expenses to assets			
	1	2	3
const	0.0077	0.019	0.0106
	(0.0181)	(0.0359)	(0.0358)
log assets	-0.0016***	-0.0014**	-0.0013*
	(0.0005)	(0.0007)	(0.0007)
total debt to assets	-0.0378***	-0.0292***	-0.0316***
	(0.0032)	(0.0049)	(0.0049)
Tobins_Q	0.0180***	0.0217***	0.0218***
	(0.0005)	(0.0011)	(0.0011)
ROA	-0.1558***	-0.0824***	-0.0824***
	(0.0082)	(0.0128)	(0.0128)
captive flag	0.0061***	0.0069***	
	(0.0011)	(0.0017)	
years of captive usage			0.0005***
			(0.0001)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.3714	0.3912	0.3925

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

Table 8 – Governance characteristics

This table reports the results of regressions modeling the relationship between governance variables and captive insurance usage. Panel A examines firms' compensation characteristics, and Panel B considers various ownership characteristics. In each panel, Models 1 and 2 show the results of logit regressions on the "captive use flag" variable which is a dummy variable indicating whether a company is using a captive insurance structure during the current year. Model 3 uses an ordinary least squares (OLS) regression in which the dependent variable represents the number of years since a company began using a captive insurance structure; this variable can take negative values indicating the number of years prior to the company adopting a captive insurance structure. In Model 1 the entire dataset is used in the regression, and in Models 2 and 3, only the subset of the dataset consisting of companies that used captive insurance structures during any year of the 2009-2016 period is used for the regressions. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10 percent, **5 percent, and ***1 percent levels. For logit models, "Adj. R2" is McFadden's pseudo-R squared. Definitions of all variables along with relevant calculations appear in Table 1.

Panel A: Compensation variables

Dependent variable:	captive use flag	captive use flag	years of captive use
Model type:	logit	logit	OLS
	1	2	3
const	-26.4116	43.4282	-2.5687
	(133.9601)	(429.7177)	(3.5482)
log assets	0.1523***	0.0586	0.9780***
	(0.0302)	(0.0676)	(0.1461)
total debt to assets	0.9770***	0.3959	-2.1682***
	(0.1421)	(0.3359)	(0.6998)
Tobins_Q	-0.3129***	-0.2099***	-0.0792
	(0.0348)	(0.0694)	(0.1667)
ROA	1.1951***	1.2799	4.6113**
	(0.3958)	(0.8451)	(1.9195)
log total exec comp	0.2227***	0.3746***	0.7405***
	(0.0557)	(0.1207)	(0.2651)
stock to total comp	0.2709	0.8079**	2.6981***
	(0.1696)	(0.3638)	(0.7783)
options to total comp	-0.6559***	-2.1623***	-6.2790***
	(0.2076)	(0.4460)	(1.0033)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.0644	0.1690	0.1577

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

Panel B: Ownership variables

Dependent variable:	captive use flag	captive use flag	years of captive use
Model type:	logit	logit	OLS
	1	2	3
const	-23.7858	23.9298	4.7568***
	(133.0004)	(124.9402)	(1.5109)
log assets	0.2383***	0.2409***	0.8894***
	(0.0231)	(0.0534)	(0.1086)
total debt to assets	0.9041***	0.4214	-2.3381***
	(0.1522)	(0.3576)	(0.7378)
Tobins_Q	-0.2903***	-0.2857***	-0.3944**
	(0.0352)	(0.0693)	(0.1662)
ROA	1.3479***	1.8707**	6.4152***
	(0.4266)	(0.9194)	(2.1005)
total institutional ownership	-0.2868	-0.1146	-1.1228
	(0.2538)	(0.5545)	(2.4733)
blockholder holdings	0.5114***	0.6463*	1.5242*
	(0.1781)	(0.3867)	(0.8771)
insider holdings	1.3546***	1.2843***	2.5960**
	(0.4647)	(0.4801)	(1.2160)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.0700	0.1799	0.1700

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

Table 9 – Governance and financial model comparisons

This table reports the results of regressions modeling the relationship between governance variables and financial variables and captive insurance usage. Panel A examines the compensation and ownership characteristics of firms, and Panel B considers the financial measures that captive insurance is proposed to affect. In each panel, Models 1 and 2 show the results of logit regressions on the "captive use flag" variable, which is a dummy variable indicating whether a company is using a captive insurance structure during the current year. Model 3 uses an ordinary least squares (OLS) regression in which the dependent variable represents the number of years since a company began using a captive insurance structure; this variable can take negative values indicating the number of years prior to the company adopting a captive insurance structure. In Model 1 the entire dataset is used in the regression, and in Models 2 and 3, only the subset of the dataset consisting of companies that used captive insurance structures during any year of the 2009-2016 period is used for the regressions. All models use dummy variables to control for year effects and industry group effects. Standard errors appear in parentheses below coefficients, and statistical significance is denoted at the *10 percent, **5 percent, and ***1 percent levels. For logit models, "Adj. R2" is McFadden's pseudo-R squared. Definitions of all variables along with relevant calculations appear in Table 1.

Panel A: All governance variables

Dependent variable:	captive use flag	captive use flag	years of captive use
Model type:	logit	logit	OLS
	1	2	3
const	-23.6436	24.376	4.2015***
	(133.3832)	(126.1317)	(1.5670)
log assets	0.2094***	0.2325***	1.1093***
	(0.0338)	(0.0790)	(0.1633)
total debt to assets	0.9351***	0.6693*	-2.5389***
	(0.1548)	(0.3522)	(0.7524)
Tobins_Q	-0.2960***	-0.2147***	-0.0916
	(0.0370)	(0.0753)	(0.1760)
ROA	1.2633***	1.6199*	5.1763**
	(0.4326)	(0.9535)	(2.1228)
log total exec comp	0.1411**	0.2622**	0.2731
	(0.0586)	(0.1297)	(0.2960)
stock to total comp	0.6101***	1.5589***	2.8755***
	(0.1723)	(0.3725)	(0.8301)
options to total comp	-0.5631***	-2.4400***	-6.1454***
	(0.2119)	(0.4596)	(1.0744)
total institutional ownership	-0.2873	-0.1675	-0.8597
	(0.2589)	(0.5531)	(0.9010)
blockholder holdings	0.4891***	0.3862	2.5593
	(0.1888)	(0.3935)	(2.4979)
insider holdings	1.2722***	1.3831***	2.4870**
	(0.4800)	(0.4671)	(1.2219)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.0711	0.1879	0.1786

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

Panel B: All financial variables

Dependent variable:	captive use flag	captive use flag	years of captive use
Model type:	logit	logit	OLS
	1	2	3
const	-23.9936	24.3158	1.2606
	(142.1132)	(124.8987)	(1.2958)
log assets	0.2817***	0.2340***	0.9701***
	(0.0211)	(0.0482)	(0.0977)
total debt to assets	0.6835***	0.1674	2.2684***
	(0.1628)	(0.3766)	(0.7816)
Tobins_Q	-0.2131***	-0.1551**	-0.0282
	(0.0381)	(0.0727)	(0.1734)
ROA	0.6624	0.5139	3.5607*
	(0.4472)	(0.9229)	(2.0545)
cost of debt	-0.1264**	-0.1323**	-0.3831***
	(0.0580)	(0.0599)	(0.1426)
marginal tax rate	-0.0073	-1.7682*	-5.0775**
	(0.4328)	(0.9037)	(2.0139)
dividends to assets	2.4817**	1.0005	1.6581
	(0.9849)	(1.1303)	(3.1137)
advert+R&D to assets	5.5473***	5.5328***	18.4498***
	(0.8242)	(1.4276)	(3.5298)
year effects	yes	yes	yes
industry effects	yes	yes	yes
n	9349	2912	2912
Adj. R2	0.0525	0.1311	0.0994

Standard errors appear in parentheses below coefficients

* denotes significance at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level

7 Conclusions

This dissertation examines aspects of governance vis-à-vis shareholding characteristics and the ensuing relationship with corporate decisions and firm performance. I ask how ESG quality and disclosure relate to financial performance and the holdings of various categories of institutional investors. I then break down the three pillars of ESG and measure their relative effects on financial performance and the demand from institutional investors. I then extend this examination to consider the ESG preferences of institutional investors with regard to alternative asset classes. Finally, I look at how governance and institutional investors impact corporate behavior and financial performance when regulatory fines are levied, and how governance factors affect a firm's decision to employ captive insurance as a risk-management tool.

7.1 Findings

7.1.1 Chapter 2

Chapter 2 examines the role of ESG stewardship codes and mandatory ESG disclosure regimes for institutional investors and companies in affecting the relationships between disclosure, ESG quality, and financial performance.

Using a unique international dataset, I examine the link between the extent of ESG disclosure and ESG quality through a cross-country comparison of varying ESG disclosure regulations and stewardship codes. This chapter includes four key findings. First, I find a strong relationship between the quantity of ESG data disclosed by companies and the quality of these data. Second, the differences across countries seem to be driven by more-stringent ESG disclosure requirements and stewardship codes imposing ESG disclosure. Third, I find evidence that ESG is correlated with decreased risk; however, this effect may be due to firms disclosing more information than just the quality of the firms' ESG factors. Finally, I find a negative relationship between ESG and performance in the US, which is consistent with the fact that ESG-oriented investors are willing to pay a premium for high-quality ESG

investments. This chapter also contributes to the ongoing debate about how introducing mandatory corporate and institutional investor reporting affects ESG issues.

7.1.2 Chapter 3

Chapter 3 studies the effect of ESG generally and of the three ESG pillars—environmental, social and governance—on the portfolio allocations of institutional investors. Using holdings data drawn from SEC 13F and 13D/G filings of institutional investors and blockholders of US equities, I analyze the relationship between company ESG characteristics, various categories of investors' portfolio allocations, and financial performance.

I find that, while investors are driven to add high-quality ESG companies to their portfolios, there is a negative relationship with ESG when it comes to allocating large portfolio weightings. I also find that institutional investors have a preference for ESG disclosure over the actual ESG quality of portfolio companies. Blockholders appear much less motivated by ESG scores than institutional investors seem to be generally. Evaluating individual ESG pillar scores, I find that the governance score has the highest impact on institutional investor holdings, while environmental scores have the most negative effect. This suggests that high-quality ESG companies, particularly companies with high ratings in the environmental dimension, receive too much attention from large institutional investors and are in danger of being overvalued. These results lend support to the claims that activist investors are increasing their stakes in companies with poor ESG performance (see, for example, Barko et al., 2018). This is consistent with the theory that some investors can essentially arbitrage governance as proposed by Gibson and Gordon (2013) and extended to ESG factors generally by Christie (2021).

Chapter 3 then examines the relationship between ESG and financial performance to determine whether institutional investors are, to an extent, overweighting based on ESG data. I find that higher E scores are correlated with negative alpha, indicating that such securities are overbought. Meanwhile, G scores have a strong correlation with higher Sharpe ratios, indicating a more favorable risk-reward profile; G scores also indicate lower betas and, therefore, less exposure to systemic risk. Here, again, I find that the ESG disclosure scores are more strongly correlated with decreased risk than subjective ESG quality rankings are.

The generally positive relationship between financial performance and ESG supports the argument that activist investors prefer to find value in companies that are underperforming financially and with respect to ESG; this helps to explain why ownership stake size is negatively correlated with high-quality ESG.

However, when I look exclusively at very large asset managers such as the Big Three (Blackrock, State Street, and Vanguard), I find a very strong positive relationship between E scores and holdings. The finding that higher E scores are associated with negative alpha, indicating that they are overvalued, is consistent with the fact that the Big Three are weighting their extremely large portfolio holdings towards such companies, thus increasing overall demand for companies with high E scores. This finding with respect to ownership by very large asset managers is broadly consistent with the findings of Azar et al. (2021) and Gianfrante et al. (2021), who also find that ownership by the Big Three is related to improved environmental performance over time. In the context of the theory of systematic stewardship proposed by Gordon (2022), the large holdings across companies and industries motivate very large asset managers to decrease systemic risks much more than they motivate smaller shareholders. Therefore, my results can be viewed through the lens of this theory as evidence that the Big Three overweight towards E in order to influence companies to improve their environmental performance so as to decrease the exposure this brings to systemic risk despite the relationship with financial underperformance.

Overall, the results in this chapter also support recent evidence of the portfolio-optimization benefits of ESG. My findings also help to bridge a gap in the literature by showing the relative impact of each of the three subfactors of ESG and clearly distinguishing between the disclosure and quality of ESG. These findings contribute to the literature by shedding light on the ESG preferences of institutional investors—in aggregate, across each subdimension, and between ESG quality and disclosure.

7.1.3 Chapter 4

Chapter 4 uses data from a survey of institutional investors and alternative asset managers to better understand the challenges and opportunities of incorporating ESG into their investment management processes, and how this differs by type of investor. This unique data set is

constructed based on a 2020 survey of 109 institutional investors from Europe and North America, as well as a small percentage of respondents from around the world. These data allow me to shed light on the intensity and use of ESG, distinguishing between GPs and LPs (as a proxy for the degree of control over portfolio companies) and between PE and VC firms (as a proxy for the age of portfolio investments). First, I find that LPs are motivated to incorporate ESG because they believe that ESG usage is more strongly correlated with financial performance. GPs are motivated to integrate ESG factors in their investment strategies in response to increased client demand for sustainable products. Second, I find that PE firms use ESG factors more intensely than VC, regardless of geography. Third, I consider that investors can choose between voice and exit in their approach to ESG investing. I find that PE firms use voice and exit strategies more extensively than VC funds in efforts to promote ESG activities in companies. Finally, I find that the investors consider the governance score the most important component of ESG.

The findings in this chapter make three contributions to the literature. First, they provide new insights into the importance that LPs and GPs place on ESG, highlighting the motivations for and barriers to ESG usage. Second, my findings contribute to the literature on ESG integration by private equity and other alternative asset classes by showing that PE firms are more likely than VC to firms use ESG more intensively, regardless of where the alternative asset managers are located. Third, I contribute to the literature on investor engagement in ESG with my analyses of the use of voice and exit by LPs and GPs and my findings that PEs use voice and exit more often than VCs.

7.1.4 Chapter 5

Chapter 5 examines the role that corporate governance can play in mitigating corporate risk-taking behavior and insulating firms from market-related reputational costs. Using an event study methodology, I examine market reaction to the FinCEN leaks containing previously undisclosed regulatory filings (Suspicious Activity Reports) by banks and other financial institutions. I then compile a dataset of the announcement dates and amounts of regulatory penalties levied against financial institutions. An ex-ante analysis shows that governance and shareholding structures can mitigate risk-taking behavior, as evidenced by lower fines. An event study of the announcement of the fines allows for an ex-post analysis, showing that

companies with better governance suffer a more muted market reaction to the announcement of regulatory fines.

This chapter contributes primarily to the growing literature on how markets and regulators each play a role in fostering economic trust and how markets, as well as regulators, punish companies for transgressions via increased reputational costs impacting firm value (see, for example, Dupont and Karpoff, 2020; Chava et al., 2018; Agrawal and Chadha, 2005; Karpoff et al., 2008). However, in this chapter, I explicitly consider the role of governance and shareholding structures in this paradigm. I also contribute to the literature on financial-related data leaks (Huesecken et al., 2018; O'Donavan et al., 2019) and to the literature on bank performance and fines (Koster and Pelster, 2017, Graham et al., 2008; Erkens et al., 2012) by incorporating governance characteristics into the analysis.

7.1.5 Chapter 6

Chapter 6 employs a unique, hand-collected dataset documenting firms' captive insurance usage over time in order to examine shareholder motivations for utilizing captive insurance structures and the financial implications. I consider the motivations of company insiders and blockholders to form captive insurance structures. I then compare the financial results of captive insurance usage and show that governance considerations are more powerful motives than financial ones.

Finally, with Chapter 6, I contribute to the literature on firms' captive insurance usage by examining captive insurance as a form of hedging with similar governance-related motivations. Considering captive insurance as a form of risk management, along with hedging, I also contribute to the literature on hedging and risk management by incorporating a range of financial and governance motives into the analysis in order to compare the relative strengths of these motivations.

7.2 Further research

There are several areas in which further future research can extend the work presented in this dissertation. These areas are related primarily to trends in ESG standardization and measurement, sustainable debt securities, and common ownership.

In terms of evaluating and measuring ESG, previous research has considered the proliferation of ESG ratings with greater dispersion among ratings providers (see, for example, Gibson et al., 2021; Christensen et al., 2021). The lack of standardized, objective measurements for ESG have led to increased concerns over greenwashing (see Gatti et al., 2019, for an overview). Various regimes in many jurisdictions are requiring companies and investors to disclose ESG-related information, as well as stewardship codes for institutional investors related to ESG data analysis and disclosure, as examined in Chapter 2 of this dissertation. Despite this, widespread standardization has not yet occurred. However, the trends towards adaptation of standardized reporting requirements related to ESG (see Chapter 2 for a discussion of some of these initiatives) may lead to increased convergence and objectivity of ESG-related data. Reliability of these data and a decrease in greenwashing concerns may result as regulators adopt auditing requirements for ESG data. These trends are still developing, but as they progress, and more data become available, the research presented here will provide the basis for further research to expand on the issues I examine, in light of more-objective data measurements and greater standardization of ESG-related characteristics.

The market for sustainable and green corporate bonds is still in its relative infancy. The studies conducted so far (see, for example, Baker et al., 2018; Flammer, 2020) have had only a limited timeframe of data to work with and have focused on the market for green and sustainable bonds in isolation. As this market develops and there is greater issuance and trading of these bonds, the issues examined in this dissertation with respect to ESG and publicly traded equity securities can be extended to consider the impact of ESG on other company securities once these markets are further developed and more data are available. This could involve examining the relationship among corporate ESG policies, the performance characteristics of sustainable and green bonds, and institutional investor interest in equity and debt securities issued by the same firms.

The trend of common ownership has seen very large institutional investors accumulate large, concentrated holdings across industries and the greater economy (see, for example, Fichtner et al., 2017; Schmalz, 2018). It may be that increased common ownership does not matter: these positions tend to be large and, therefore, relatively illiquid, and this may limit the possibility that these investors will have much control. While large investment managers are incentivized to increase total firm value in order to increase total assets under management from which they derive fees, they are able to more effectively increase assets under management by bringing in new investments, rather than by actively engaging with companies to increase shareholder value (Lewellen and Lewellen, 2022). In this case, there would be investment opportunities for activist investors to engage in and increase governance in such companies, effectively arbitraging governance (Gibson and Gordon, 2013). This view that common ownership does not affect ESG may be supported by evidence that the largest institutional investors are not actively engaged in shareholder proposals and proxy voting related to ESG (see, for example, Fichtner et al., 2017; Griffin, 2020). But this does not take into account that these large investors have enough clout to influence management decisions via channels other than shareholder voting (Fichtner et al., 2017).

On the other hand, Gordon (2022) argues that common ownership means that large institutional investors are much less exposed to firm-specific risks, thanks to their extreme diversification; this incentivizes these investors to push firms to reduce systemic, market-wide risk. This explains how common ownership can result in decreased competition and greater profitability across an industry (Azar et al., 2018; Azar et al., 2021) but, at the same time, can lead to greater innovation in an industry by lowering the negative costs of the spillovers of technological innovations (Anton et al., 2021). This view is consistent with empirical evidence that large institutional ownership results in positive ESG-related improvements in companies over time (Dyck et al., 2017; Azar et al., 2020); however, it is unclear at this stage if this is due to institutional ownership generally or specifically related to common ownership.

Ultimately, although the common ownership trend is not new, it has only recently reached critical levels, and we are starting to see evidence of its effects. As this trend continues, more data will allow for the examination of the relationship between very large institutional ownership and their incentives due to large common ownership, other blockholders whose

holdings are less diversified, smaller institutional investors, and company insiders. The ensuing conflicts of interest have implications for whether companies seek ESG improvements related to mitigating firm-specific risk or whether ESG changes which will reduce industry-wide or economy-wide systemic risks. In addition to affecting corporate ESG policies and the relationship with financial performance, common ownership would have implications for firm hedging and captive insurance decisions. In these respects, my research will be an important foundation for further research into the effects of common ownership.

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