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Essays in Corporate Governance and Sustainable Finance

by

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Abstract

This thesis consists of two essays in corporate governance and sustainable finance. In the first essay, we exploit an overlooked aspect of constituency statutes – an emphasis on considering the long-term interests of the firm – and study whether the staggered enactment of the statutes in different U.S. states actually encourages firms to manage for the long-term. We find that for firms in the technology and pharmaceutical industries, where a longer-term orientation matters the most, executive compensation contracts have longer vesting periods, shareholder composition changes towards greater long-term institutional ownership, firms conduct less earnings management, and spend more on R&D after the enactment of constituency statutes. We further show that lengthening the firm horizon increases firm value, but at the expense of decreasing cash flows. Overall, our study shows that lengthening the firm horizon benefits firms in the technology and pharmaceutical industries, but not other firms.

In the second essay, we study the resiliency of environmental and social (ES) stocks during the COVID-19 market crash. The COVID-19 pandemic and the subsequent lockdown brought about an exogenous and unparalleled stock market crash. The crisis thus provides a unique opportunity to test theories of ES policies. This paper shows that stocks with higher ES ratings have significantly higher returns, lower return volatility, and higher operating profit margins during the first quarter of 2020. ES firms with higher advertising expenditures experience higher stock returns, and stocks held by more ES-oriented investors experience less return volatility during the crash. This paper highlights the importance of customer and investor loyalty to the resiliency of ES stocks.

Collectively, this thesis contributes to the literature by showing that firms' long-term orientation, including investments in environmental and social initiatives, creates value for them.

Preface

Chapter 2 of this thesis is based on a working paper with Dr. Yrjo Koskinen and Dr. J. Ari Pandes. I contributed to this paper by proposing the initial idea, gathering data, estimating empirical results, and having regular meetings with my co-authors to refine research ideas. Chapter 3 of this thesis has been published as Rui Albuquerque, Yrjo Koskinen, Shuai Yang, Chendi Zhang, Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash, *The Review of Corporate Finance Studies*, Volume 9, Issue 3, November 2020, Pages 593–621. I contributed to this paper by gathering data, estimating empirical results, and having regular meetings with my co-authors to refine research ideas. In accordance with theses copyright guidelines of the University of Calgary, I have obtained permissions from my co-authors (for Chapters 2 and 3) and the publisher (for Chapter 3).

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Chapter 1 Introduction

Topics related to firms' longevity and sustainability have gained increasing attention in recent years. In finance, we aim to understand the relationship between firms' sustainability and their financial performance, and more importantly, the causal direction of this relationship. By exploiting two different experiments in Chapters 2 and 3, this thesis investigates how firms' long-term orientation and sustainable way of thinking in corporate governance influences firm value.

In Chapter 2, we study whether lengthening the firm horizon creates value. This chapter exploits an overlooked aspect of constituency statutes – an emphasis on the long-term interests of the firm – and examines whether the staggered enactment of the statutes in different U.S. states actually encourages firms to manage for the long-term. We then examine the potential implications of adopting a longer-term orientation.

We measure a firm's long-term orientation from different perspectives, and show that constituency statutes indeed encourage firms to manage for the long-term, especially for firms in the technology and pharmaceutical industries. In particular, we find that firms in the technology and pharmaceutical industries, where a longer-term orientation matters the most, exhibit executive compensation contracts with longer vesting periods, a change in shareholder composition towards greater long-term institutional ownership, less earnings management, and more R&D investment after the enactment of constituency statutes.

We next examine the effect of a longer-term orientation on firm value. We find that our alternative measures of firm value all increase after the enactment of constituency statutes, with these effects concentrated among firms in the technology and pharmaceutical industries. Lastly, we explore whether the shift to a longer-term thinking influences firm cash flows. We find that after the enactment of constituency statutes, firms in the technology and pharmaceutical industries on average experience a decrease in operating cash flows during the sample period, which is a cost of adopting a longer-term horizon. Collectively, this chapter shows that constituency statutes encourage firms to adopt a longer decision horizon, which ultimately creates value for firms. However, this effect matters the most for firms in the technology and pharmaceutical industries, but not other firms.

In Chapter 3, we study the resiliency of environmental and social (ES) stocks during the COVID-19 market crash. The predominant view among academics and practitioners is that environmental, social, and governance (ESG) activities bring greater value for firms and their shareholders. However, it remains a challenge to draw a clear causal direction and understand the underlying mechanisms. In this chapter, we study the causal relationship between ESG and financial performance by exploiting the exogenous market crash induced by COVID-19.

We argue that the COVID-19 pandemic presents an unparalleled shock because of its exogenous nature related to public health reasons rather than economic conditions, and also the unprecedented speed of the market crash that left firms with very limited time to respond. We focus on the ES aspects of ESG to avoid capturing a governance effect. We firstly show that abnormal returns in the first quarter of 2020 are significantly positively correlated with ES ratings in our cross-sectional regressions. More importantly, we implement a difference-in-differences identification strategy with a COVID-19 event date of February 24, when the stock market decline accelerated. We find that firms with high ES ratings earn higher daily returns during the market crash, compared to firms with low ES ratings.

We then show that high ES-rated firms display lower volatility of stock returns during the first quarter of 2020, in both our cross-sectional and difference-in-differences regressions. As for the operating performance of firms with high ES ratings, we find that they realize higher operating profit margins than their peers with low ES ratings.

We further investigate the two theories of customer and investor loyalty to answer how ES policies help build resiliency. Consistent with our expectations, we find that the effect on stock returns is stronger for firms with high ES ratings coupled with stronger customer loyalty, compared to firms with high ES ratings but weaker customer loyalty during the market crash. We also find that the effect on range-based volatility is stronger for firms with high ES ratings coupled with investor ES preferences. Customer loyalty plays a more important role in explaining the level of stock returns, while investor ES preferences is a more important factor for the volatility of stock returns. Collectively, this chapter shows that ES stocks are more resilient relative to other stocks during the market crash in the first quarter of 2020, and customer and investor loyalty contributes to the resiliency of ES stocks.

Chapter 2 Is Lengthening the Decision Horizon Good for Firms?

2.1 Introduction

The title of an opinion piece that appeared in *The New York Times* on December 2019 puts the state of America's free-market capitalism succinctly: *Short-Term Thinking is Poisoning American Business*[1].

As the above quote indicates, it is widely believed that short-termism is a major problem for U.S. firms. Supporting this claim, a frequently cited study by Graham, Harvey and Rajgopal (2005) finds that 78 percent of the managers in public firms were willing to meet short-term targets by sacrificing firm value in the long run. Consistent with this claim, the CFA Institute estimates that the cost of short-termism to S&P 500 companies is $79 billion annually (Orsagh, Allen and Schacht, 2020)[2].

Asserting that corporate short-termism has been on the rise since 2000, a McKinsey report calls for a deeper understanding of the factors driving corporate long- or short-termism (*McKinsey & Company*, 2017). In this study, we aim to address the issue of whether lengthening the firm horizon creates value, and examine the trade-offs and consequences of adopting a longer-term orientation.

We exploit a quasi-natural experiment: the staggered enactment of constituency statutes in 35 U.S. states. A common provision of the statutes, which has been overlooked in the finance literature, is to explicitly allow directors to consider the long-term interests of the firm. We thus focus on this neglected aspect of constituency statutes and study whether the statutes lengthen

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[1] Beck and Seru, December 21, 2019.

[2] Several recent examples suggest that short-term thinking may be common among U.S. corporations: Wells Fargo opened millions of fraudulent personal accounts and enrolled customers into unwanted insurance just to meet its aggressive sales targets (Cowley and Flitter, 2018); Chrysler untruthfully reported its sales of new cars from 2012 to 2016 in order to maintain a "streak" of continuous sales growth that actually ended in September 2013 (Shepardson, 2019); and more recently, Boeing "cut corners" in the production of the 737 Max and rushed the plane to market, which was believed to play a part in two deadly crashes (Gelles, 2019).

the firm horizon, and then examine the potential implications of a shift to a longer-term orientation.

Our results reveal important findings. First, we find that constituency statutes encourage firms to manage for the long-term, especially for firms in the technology and pharmaceutical industries. In particular, after the adoption of constituency statutes, we show that executives have a longer-term oriented compensation structure, the shareholder composition changes towards greater long-term institutional ownership, firms conduct less earnings management and spend more on R&D, mainly among firms in the technology and pharmaceutical industries. We focus our attention on technology and pharmaceutical firms, because these firms employ more intangible assets and invest more in R&D activities. These investments are by their nature longer-term oriented, since it takes time for these investments to yield profits (Brown, Fazzari and Petersen, 2009; Chan, Lakonishok and Sougiannis, 2001; Chan, Martin and Kensinger, 1990). For all our sample firms including those in the technology and pharmaceutical industries, we find greater spending on capital expenditures and also on intangible capital after the enactment of constituency statutes.

Second, we examine whether the shift to a longer-term thinking matters for firm value. We show that firm value increases, as measured by alternative proxies including Tobin's Q, Total Q (Peters and Taylor, 2017) and an enterprise value multiple, with these effects concentrated among firms in the technology and pharmaceutical industries. These results suggest that a longer firm horizon after the enactment of constituency statutes ultimately benefits the firm, providing evidence that supports a greater focus on corporate long-termism in the technology and pharmaceutical industries.

Third, we examine whether the shift to a longer-term thinking has an impact on firm cash flows. We expect that the shift to a long-term horizon is associated with a reduction in operating cash flows, since it involves sacrificing the short-term for the long-term. Otherwise, without a short-term cost, all firms would adopt a longer-term orientation to increase firm value. Importantly, the adoption of the constituency statutes provides managers a legal shield to focus on the long-term, freeing them from concerns about short-term underperformance. We find that after the adoption of constituency statutes, firms in the technology and pharmaceutical industries on average experience a decrease in operating cash flows during the sample period.

Overall, we make important contributions to the corporate long- and short-termism debate. Contrary to what the headlines suggest, short-termism does not appear to be a widespread problem. We show that constituency statutes can mitigate short-term opportunism and lengthen the firm horizon, which ultimately increases firm value, but mainly for firms in the technology and pharmaceutical industries – not all firms.

Our paper sets us apart from the existing literature that examines the adoption of constituency statutes. The literature has focused on stakeholder orientation, and in particular, the efficacy of the statutes on the takeover market, since constituency statutes were generally enacted to fend off hostile takeover bids to protect stakeholders (e.g., Flammer and Kacperczyk, 2016; Gao, Li and Ma, 2020). However, Cain, McKeon and Solomon (2017) study the relationship between hostile takeovers and constituency statutes as well as 16 other anti-takeover laws, and find that constituency statutes do not have a discernible effect in mitigating hostile takeovers. Consistent with Cain et al. (2017), we confirm that constituency statues do not affect takeover activity. Moreover, Bebchuk and Tallarita (2020) show that managers seldom use their power granted by constituency statutes to protect stakeholder interests in takeovers, and even if they do so, their actions are cosmetic and inconsequential. Bebchuk, Kastiel and Tallarita (2020) further add that constituency statutes do not make managers better at considering stakeholder interests, whether in takeovers or in the overall operations of firms. Collectively, our findings are thus hard to reconcile with studies that examine the effect of constituency statutes on the takeover market[3].

Apart from takeover protection, the existing finance literature also examines the enactment of constituency statutes more generally from the stakeholder orientation perspective. For example, Flammer and Kacperczyk (2016) find that the statutes increase firms' patent count, citations, and originality. Gao, Li and Ma (2020) show that the spread on bank loans decreases after the enactment of constituency statutes. Both papers attribute the increase in patents and the decrease

[3] Under a different setting than constituency statutes, Raghunandan and Rajgopal (2020) study the stakeholder-oriented Business Roundtable (BRT) declaration of August 2019. They show that the firms that signed the BRT statement commit more environmental and labor-related violations, implying that stakeholder orientation is just cheap talk.

in bank loan spreads to the stronger stakeholder orientation provided by constituency statutes. However, these results can also be driven by the long-termism provision of the statutes. In particular, longer-term oriented firms tend to invest more in innovation and build stronger long-term relationships with debtholders, which can lead to greater patent output and reduced debt costs. Other papers that examine the increased stakeholder orientation provided by constituency statutes document a decrease in firms' discretionary accruals (Ni, 2020), a decrease in the risk-taking actions among banks (Leung, Song and Chen, 2019), and a decrease in the risk-taking behavior of CEOs (Petit-Romec, 2019)[4]. Indeed, these results can also be driven by the long-termism provision of the statutes.

In contrast to the existing literature, we make unique contributions by studying the aspect of constituency statutes that lengthens the firm horizon. Our long-termism channel is motivated by a law literature that discusses how constituency statutes also feature the consideration of long-term interests as one of the common provisions. Specifically, Bisconti (2009) points out that one of the common provisions is that "the directors may consider both long-term and short-term interests of the corporation." Silver-Thompson (2014) further argues that constituency statutes act as a "corporate shield", which protects directors from liabilities when they plan for the long-run but miss short-term targets. In addition, Standley (2012) argues that the explicit permission of long-termism can encourage managers to adopt a long-term horizon if they had concerns to do so previously. Motivated by this literature, we argue that after the enactment of constituency statutes, managers have more latitude to manage for the long-term. Indeed, shareholder wealth maximization is inherent in managers' fiduciary duty, and that duty would ideally require them to focus on the long-term. However, before the statutes, even if managers were planning for the long-term at the expense of short-term interests, they may have been worried about the backlash from impatient boards or shareholders who may have required immediately recognizable earnings. With the explicit permission provided by the constituency statutes, managers are protected from liabilities when planning for the long-term, but temporally sacrificing the short-

[4] The measures of risk-taking behaviors of CEOs in Petit-Romec (2019) are the delta and vega of CEOs' pay. The delta (vega) is the sensitivity of CEOs' pay to stock price (volatility). These two measures should not be confused with the executive compensation duration used in our paper. Gopalan, Milbourn, Song and Thakor (2014) are one of the first to discuss the executive horizon length and construct a novel measure for it, i.e., the executive compensation duration.

term. We thus focus on this long-termism aspect of constituency statutes to show that the statutes can lengthen the firm horizon.

We note that while the long-termism provision of the constituency statutes is an obvious link to lengthen the firm horizon, it is conceivable that the stakeholder-orientation provision also contributes to a longer-term orientation for firms. While the literature has not established a formal link between stakeholder orientation and long-termism, firm policies that meet the needs of *all* stakeholders would also be considered to be long-term oriented. Thus, we cannot rule out the possibility that more than one provision in the constituency states leads to a greater long-term focus.

In subsequent analysis, we examine whether lengthening the firm horizon matters for firm value. Cremers, Guernsey and Sepe (2019)[5] show that constituency statutes lead to an increase in firm value. We also confirm for our sample that firm value increases after the adoption of constituency statutes, as measured by Tobin’s Q, Total Q and an enterprise value multiple. However, we further find that the increase in firm value is concentrated among firms in the technology and pharmaceutical industries. Our results thus show that the average positive effect of constituency statutes on firm value across the full sample of firms is mainly driven by the subsample of firms in the technology and pharmaceutical industries. This finding provides support for the notion that constituency statutes encourage firms to manage for the long-term, as firm value only increases for the subsample of firms in which long-term investments matters the most.

We test the validity of our differences-in-differences identification strategy by analyzing the dynamics of the treatment effects. In particular, a key assumption of the difference-in-differences identification strategy is that there is no pre-existing trend among the treatment and control groups. The dynamics of the treatment effects also helps us identify whether there is a lagged treatment effect. We do not find pre-existing trends for our variables including compensation-

[5] Focusing on the aspect of stakeholder orientation, Cremers et al. (2019) systematically review the effect of constituency statutes on firm value, and focus on the bonding hypothesis of takeover defenses (as in Johnson, Karpoff and Yi, 2015). This hypothesis argues that constituency statutes are a takeover defense mechanism and can bond the firm to its stakeholders since takeovers are usually associated with a change in ownership and operating strategies that may expropriate other stakeholders besides shareholders.

based executive horizon, shareholder composition, discretionary accruals and R&D investment, as well as our other variables, which alleviates the concern that the treatment and control groups exhibit a difference before the event. We also add interaction terms with the technology and pharmaceutical industries in examining pre-existing trends. We do not find pre-existing trends between firms in the technology and pharmaceutical industries and other firms. Interestingly, the results also reveal that the increase in firm value mainly manifests two or three years after the constituency statutes. This lagged effect is important, as it provides further support for the idea that the increase in firm value after the enactment of constituency statutes is due to a longer horizon of the firm, since the corresponding long-term oriented investments may take some time to fully manifest.

The remainder of this paper is organized as follows: Section 2 reviews the additional related literature. Section 3 reviews the background of constituency statutes. Section 4 describes our data and methodology. Section 5 interprets our empirical results. Section 6 checks the robustness of our results. Section 7 concludes.

2.2 Additional Literature

Our paper also contributes to several other streams in the literature. In particular, the existing literature has discussed the causes of corporate long- and short-termism. This stream of literature is largely composed of theory papers. Narayanan (1985) presents a model in which managerial incentives to enhance career reputation and thus boost wages lead managers to overemphasize short-term profits. Stein (1989) presents a model whereby stock market pressures induce myopic corporate behaviour such as inflated earnings. Bolton, Scheinkman and Xiong (2006) develop an agency model of executive compensation and point out that in a speculative stock market with heterogenous investors (including overoptimistic investors), compensation can incentivize managers to focus on the short-term stock performance at the cost of long-term fundamental value.

Solutions to deter short-termism are also modeled in the current literature, such as blockholder monitoring (Edmans, 2009), dynamic CEO compensation (Edmans, Gabaix, Sadzik and

Sannikov, 2012), lowering the risk of project termination and deferring managerial compensation (Varas, 2018), and hedge fund activism (Brav, Jiang and Kim, 2015; Brav, Jiang, Ma and Tian, 2018; Bebchuk, Brav and Jiang, 2015). Marinovic and Varas (2019) discuss how compensation contracts should incentivize managers' effort and also prevent them from manipulating performance at the expense of firms. The optimal contract should combine managers' long- and short-term compensation during their tenure. Gryglewicz, Mayer and Morellec (2020) present a model where recent poor firm performance may induce short-term behavior. In contrast to the previous literature, we show that statutory changes can affect firms' planning horizon, and can change the balance between a firm's short- and long-term thinking. Importantly, by exploiting a quasi-natural experiment, we are able to draw causal links between the enactment of constituency statutes and the firm horizon. We also contribute to the literature by employing an extended set of measures to describe corporate long-termism from different perspectives.

There is also an ongoing debate in the existing literature on the costs and benefits of corporate short- and long-termism. Studies have found that a firm's short-termism is associated with a cut in R&D and capital investment (Edmans, Fang and Lewellen, 2017), more managerial misbehavior such as financial fraud (Harford, Kecskés and Mansi, 2018), a decline in investment (Kraft, Vashishtha and Venkatachalam, 2018), and a higher likelihood of financial distress and lower returns during crises (Kolasinski and Yang, 2018). Long-termism is associated with a more effective board of directors (Gonzalez and Andre, 2014), less frequent changes in investment plans (Polk and Sapienza, 2008), and less earnings management (Brochet, Loumioti and Serafeim, 2015). Although the mainstream views tend to favor a longer-term orientation over a shorter-term one, the empirical evidence is not conclusive. Notably, Fried and Wang (2019) show that a firm's short-termism is not the driving factor for the lack of investment and innovation. Lundstrum (2002) finds that agency costs are smaller when firms have a short investment horizon, and Larcker (1987) shows that executives with short-term compensation contracts spend less on discretionary expenditures that are typically not in the best interests of the shareholders. More recently, Giannetti and Yu (2020) find that firms with a short-term horizon adapt more quickly to the changing competitive environment and have better innovation performance. In contrast to the outcomes studied in the previous literature, we focus on firm value as an overall measure and show that corporate long-termism can increase firm value for firms in the technology and pharmaceutical industries, but not other firms.

2.3 Constituency Statutes and Long-term Firm Interests

The takeover wave in the 1980s witnessed an increase in hostile takeovers that were fuelled by risky non-investment grade debt (e.g., Shleifer and Vishny, 1991). The concerns raised regarding the negative effects from these takeovers on various corporate stakeholders led to the enactment of regulations called constituency statutes (e.g., Bainbridge, 1992; Barzuza, 2009).

After Ohio passed its constituency statute in 1984, 35 U.S. states have adopted such statutes (see Table 2.1 for a detailed timeline). Bisconti (2009) summarizes the common provisions of the constituency statutes as follows:

1. *The board of directors of a corporation may consider the interests and effects of any action upon non-shareholders.*
2. *The relevant non-shareholder groups include employees, suppliers, customers, creditors, and communities.*
3. *The directors may consider both long-term and short-term interests of the corporation.*
4. *The directors may consider local and national economies.*
5. *The directors may consider any other relevant social factors.*

The vast majority of the current finance literature has focused on the first provision stated above (e.g., Flammer and Kacperczyk, 2016; Gao et al., 2020; Ni, 2020). In this study we focus on the third common provision in the constituency statutes that relates to the consideration of the long-term and short-term interests of the firm, which has been overlooked in the current literature. To better understand the exact legal terms used to describe the long-term provision, consider the two examples below.

The constituency statute of Pennsylvania states that:

> *In discharging the duties of their respective positions, the board of directors, committees of the board and individual directors of a business corporation may, in considering the best interests of the corporation, consider to the extent they deem appropriate:*
>
> *…**The short-term and long-term interests of the corporation, including benefits that may accrue to the corporation from its long-term plans and the possibility that these interests may be best served by the continued independence of the corporation***. (15 Pa. Stat. and Cons. Stat. Ann. §1715(a))

In Connecticut, the constituency statute reads as:

> *A director of a corporation … may consider, in determining what the director reasonably believes to be in the best interests of the corporation, **(1) the long-term as well as the short-term interests of the corporation, (2) the interests of the shareholders, long-term as well as short-term, including the possibility that those interests may be best served by the continued independence of the corporation**…* (Conn. Gen. Stat. Ann. §33-756(d))

Although the language could vary across different states, the major provisions about long-termism are the same. In particular, the directors are permitted to consider the long-term interests of the corporation. The permissive nature of the long-termism provision has been discussed in the law literature, but not at all in the finance literature. Bisconti (2009) argues that constituency statutes free directors from liabilities as long as their decisions are based on the long-term interests of the firm, even if they miss short-term targets. Similarly, Silver-Thompson (2014) notes that constituency statutes serve as a “corporate shield.” This “corporate shield” gives directors assurance that they should worry less about the temporal change of earnings patterns when they are planning for the long-run growth. Standley (2012) emphasizes the permissive nature of the constituency statutes and argues that the explicit permission of a long-term orientation gives managers broad discretion to adopt a long-term strategy even if it means sacrificing shareholders’ short-term interests. Furthermore, Bamonte (1995), Springer (1999) and Adams and Matheson (2000) discuss the legal protection function provided by constituency statutes for managers who want to adopt corporate long-termism.

Millon (1991) discusses the relationship between the longer horizon encouraged by constituency statutes and profit maximization. He argues that profit maximization is now encouraged to be achieved in a patient and progressive manner, instead of being motivated by short-term earnings targets. Importantly, Millon (1991) argues that constituency statutes explicitly give directors the right to decline certain actions if they are only immediately beneficial to shareholders but hurt the long-term benefit of the corporation. Bainbridge (1992) also discusses this "reaffirming" function for corporate long-termism provided by constituency statutes. Shealy (2015) argues that shareholders' interests can frequently change with the shareholder composition since different shareholders have different preferences over risk and return, such that short-term profit maximization is not necessarily consistent with long-term maximization. The author argues that constituency statutes shift the managerial focus away from the short-term and ever-changing earnings goal.

2.4 Data and Methodology

2.4.1 Sample and Data Sources

We construct our sample from all Compustat firms with non-missing total assets from 1981 to 2016. Our sample ends in 2016, ten years after the last state adopted constituency statutes (see Table 2.1 for a detailed timeline). We apply standard filters and exclude firms in the financials and utilities industries, foreign stocks, ADRs, REITs and closed end funds (i.e., share codes 10 or 11). Compustat only records the current state of a firm's incorporation, and not the historical state of incorporation (Appel, 2019; Gormley and Matsa, 2016). Therefore, we follow Bourveau, Lou and Wang (2018) and Houston, Lin and Xie (2018) to obtain the historical state of incorporation from Bill McDonald's website[6]. Accounting variables are constructed from Compustat data, and stock prices are obtained from CRSP data. We also use several other databases to construct our variables of interest. Institutional ownership data is obtained from Thomson Reuters 13f filings[7]. Data on executive compensation is obtained from ExecuComp.

[6] Bill McDonald gathered the historical state of firm's incorporation by collecting company 10-K filings pooled by SEC's EDGAR (the Electronic Data Gathering, Analysis, and Retrieval system). The dataset is publicly available on Bill McDonald's website: https://sraf.nd.edu/data/augmented-10-x-header-data/.

[7] The reason why our sample starts in 1981 is that the coverage for 13f filings from Thomson Reuters begins in 1980, and we lag our control variables by one year.

M&A data is obtained from Thomson Reuters SDC. Finally, we obtain data on shareholder types (transient, dedicated, quasi-indexers) from Brian Bushee's website[8]. Our final sample consists of 104,383 firm-year observations from 1981 to 2016.

2.4.2 Variable Construction

We study whether constituency statutes affect the long-term orientation of firms, firm value and cash flows. We rely on several measures to capture the long-term orientation of firms. First, following Gopalan et al., (2014) and Gao (2010), we construct a measure for executive horizon in firm decision making. This variable is constructed based on the portion of current unvested options and stock that will be vested within the current year in the total executive compensation packages of managers. The idea is that the manager is less likely to behave myopically to boost short-term performance and cash out, if the soon-to-be-vested portion of the compensation is smaller. The long-term horizon of one manager is defined as one minus the soon-to-be-vested equity as a fraction of the compensation package. Following the literature (e.g., Bergstresser and Philippon, 2006; Peng and Röell, 2008; Erickson, Hanlon and Maydew, 2006), we take the average horizon of the five most highly compensated executives as the horizon of the management team. A longer horizon of the team implies that the executives have a greater incentive to manage for the long-term.

Second, we examine the shareholder composition following Bushee (1998) and Bushee and Noe (2000), who classify institutional shareholders into three categories based on their investment horizon: transient shareholders (short-term), quasi-indexers (medium-term), and dedicated shareholders (long-term). This classification is a composite measure based on principal factor analysis, which takes into account nine variables[9] that measure the investment horizon, portfolio concentration, turnover, and sensitivity to earnings of an institutional shareholder. Our study

[8] The dataset for institutional shareholder types is publicly available on Brian Bushee's website: https://accounting-faculty.wharton.upenn.edu/bushee/.

[9] The nine variables include: "portfolio concentration", "average percentage holding", "percent held in large blocks" and "Herfindahl measure of concentration", four variables that describe how influential the ownership of an institutional shareholder is in its portfolio firms; "portfolio turnover" and "stability of holdings", two variables that describe turnover and stability of an institutional shareholder's portfolio; "trading sensitivity to current earnings", "average earnings change of firms bought vs. firms sold" and "change in holdings in firms with positive earnings vs. firms with negative earnings", three variables that describe how sensitive an institutional shareholder is to the earnings of its portfolio firms. See Bushee (1998) for detailed variable definitions.

focuses on the effect on changing firm horizon, and thus the changing shareholder composition towards fewer transient or more dedicated investors could have similar interpretations. However, as noted in Bushee (1998), this classification gives a very low number of dedicated shareholders by construction, since institutional shareholders usually have internal rules to limit the stake they can invest in a single portfolio firm. To allow for enough temporal change of shareholder composition, we thus use the percentage of transient shareholders in a firm.

Third, we examine firm earnings management. The existing literature shows that managers with short-term concerns tend to manipulate current earnings to meet short-term targets (e.g., Guidry, Leone and Rock, 1999; Bhojraj, Hribar, Picconi and McInnis, 2009). In particular, Guidry et al (1999) test a short-term bonus maximization hypothesis and find that more short-term executive bonuses are associated with greater earnings management. We thus expect that firms with a longer-term horizon will exhibit less earnings management behavior. We measure firm earnings management by both the discretionary accruals method of the modified Jones (1991) model (used previously by, for example, Teoh, Welch and Wong, 1998, Larcker and Richardson, 2004, and Armstrong, Larcker, Ormazabal and Taylor, 2013) and by how much firms engage in real earnings management (e.g., Cohen, Dey and Lys, 2008). The discretionary accruals method measures managerial discretion to alter the reporting of accounting items to meet earnings targets, while the real earnings management method measures managerial manipulation of real activities, such as transactions that can influence cash flows and production costs. In addition, we use two alternative proxies of discretionary accruals[10]: *Discretionary Accruals1* measures the discretionary accruals by the traditional balance sheet approach, and *Discretionary Accruals2* measures the discretionary accruals by the cash flow approach (Hribar and Collins, 2002).

Fourth, we measure long-term investments by capital expenditures, R&D spending and the intangible investment portion in SG&A expenses (e.g., Enache and Srivastava, 2018, Eberhart, Maxwell and Siddique, 2004; Hirschey, Skiba and Wintoki, 2012). As all these investments

[10] As noted in Hribar and Collins (2002), although the majority of accounting literature calculates total accruals using the balance sheet approach, it could suffer from measurement errors due to the presumed articulation between the balance sheet and the income statement. The articulation refers to the changes of items in the balance sheet and the income statement that are presumed to be always linked together. However, corporate events including M&As, divestitures and translations of foreign currency can break down such articulation. The authors propose an alternative method based on cash flow statement to calculate total accruals.

incur expenses immediately but can take a much longer time to yield profits, they require a long-term commitment by the firm. We use two alternative proxies to measure a firm's R&D spending: *R&D1* defines R&D as the sum of the R&D expenses originally reported in Compustat and 30% of the adjusted SG&A[11], following Peters and Taylor (2017). The idea is that at least a fraction of SG&A are expenses invested in R&D related activities, such as database upgrading, software development and strategy consulting. *R&D2* is the R&D expenses originally reported, as is widely used in the literature. We use a new method proposed by Enache and Srivastava (2018) to measure intangible investments. This method estimates the intangible investment proportion of SG&A by using a regression-based approach, rather than assuming a constant proportion as in the previous literature. Following Enache and Srivastava (2018), we construct two variables, *Investment SG&A* and *Standardized Investment SG&A* (standardized by each industry-year), to measure the intangible investment proportion of SG&A.

We also examine the effect of constituency statutes on firm value. We use three alternative measures including Tobin's Q, Total Q, and an enterprise value multiple. Total Q is proposed by Peters and Taylor (2017). Compared to the standard Tobin's Q, Total Q additionally considers the intangible capital in the replacement cost of total capital. Following Loughran and Wellman (2011), we also use an enterprise value multiple (enterprise value/sales) as a measure of firm value, which is extensively used among practitioners.

Finally, we study the effect of constituency statutes on firm cash flows. We obtain our operating cash flow measure from the Statement of Cash Flows, which documents the origin and the destination of every dollar, and suffers less earnings management concerns. Following the literature, we use EBITDA (earnings before interest, tax, depreciation and amortization) as an alternative measure of operating cash flows. In addition, we examine the effect of the statutes on a firm's ROA.

Table 2.2 reports descriptive statistics for all the variables used in the paper. All our continuous variables are winsorized at the 1st and 99th percentiles. The Appendix provides detailed definitions and data sources for all our variables.

[11] The adjusted SG&A in Peters and Taylor (2017) is defined as the SG&A minus the R&D and the in-process R&D. See Appendix for the detailed definition.

2.4.3 Model Specification

Following the existing literature on constituency statutes (e.g., Flammer and Kacperczyk, 2016; Cremers et al., 2019; Gao et al., 2020), we use a difference-in-differences identification strategy to exploit the staggered adoption of the statutes. Specifically, we implement the following regression:

$$Dep\ Var_{ijlst} = \beta_0 + \beta_1 Constituency\ Statute_{st} + \lambda' \boldsymbol{X}_{ijlst-1} + \gamma_i + \omega_{lt} + \rho_{jt} + \varepsilon_{i,t} \qquad (1)$$

where i indexes the firm, j indexes the industry, s indexes the incorporation state, l indexes the state of location, and t indexes the year. γ_i, ω_{lt} and ρ_{jt} are the firm, state of location by year and industry by year fixed effects, respectively. $Constituency\ Statute_{st}$ is equal to 1 if the state s where firm i is incorporated adopted the constituency statute in year t. This dummy is equal to 0 if firm i's incorporation state s has not yet adopted the constituency statute in year t but will adopt the statute before our sample ends, or firm i's incorporation state s did not pass a constituency statute by 2016, the end of our sample. Thus, the group with the dummy equal to 1 is our treatment group, while the group with the dummy equal to 0 is our control group. It should be noted that when states adopt constituency statutes throughout our sample period, firms in the control group move into the treatment group. For example, Pennsylvania adopted the constituency statute in 1990, so firms incorporated in Pennsylvania are in the control group for firm-year observations before 1990, and they move to the treatment group after 1990.

The dependent variables include our measures of the long-term orientation of the firm, firm value and operating cash flows, as defined above. The treatment effect of constituency statutes, β_1, is our coefficient of interest. We include a vector of controls including firm size, leverage, institutional ownership, Tobin's Q, ROA and asset tangibility all lagged by one year. We include firm fixed effects to account for the unobserved time-invariant differences across firms. We include the state of location by year fixed effects to control for unobserved time-varying differences across states, such as the local economic conditions, politics and demographics, which are known to influence a firm's operations. We also include industry by year fixed effects to control for the unobserved time-varying heterogeneity across industries. Since our treatment is at the incorporation state level, we cluster the standard errors at the incorporation state level following the literature on constituency statutes (e.g., Flammer and Kacperczyk, 2016; Cremers et al., 2019; Gao et al., 2020).

We next examine the cross-sectional treatment effect by interacting the constituency statute dummy with the dummy for firms operating in the technology and pharmaceutical industries. Specifically, we partition the sample of firms into two subgroups: the technology and pharmaceutical industries and other industries, following the classification in the literature (e.g., Brown et al., 2009; Martinsson, 2010; Borisova, John and Salotti, 2013).

We find that 30.5% of firm-year observations in our sample come from firms in the technology and pharmaceutical industries. In addition, we also find that the observations of firms in the technology and pharmaceutical industries account for an increasing proportion throughout our sample period: the technology and pharmaceutical firms make up 22.4% of our sample in the 1980s, then the proportion increases to 28.8% in the 1990s, next we see a further increase to 35.2% in the 2000s, and finally the proportion of the technology and pharmaceutical firms remains stable at 35.4% in the 2010s[12]. The pattern of an increasing proportion of the technology and pharmaceutical firms is also documented in the literature. For example, Srivastava (2014) finds that the listed firms are composed of more and more knowledge-intensive firms since the 1970s, and Kahle and Stulz (2017) show that the listed firms as a whole exhibit a steady increase in intangible investment since 1975. We also find variations across states in terms of the proportion of technology and pharmaceutical firms. The observations of the technology and pharmaceutical firms account for 57.7% of the treated sample in Massachusetts, which is the highest proportion among the 35 states that adopted constituency statutes. In New Jersey, this proportion is 39.4%. These results are consistent with the literature that shows that Massachusetts and its surrounding states in the northeastern U.S. have high density of high tech firms (e.g., Hathaway, 2013). To sum up, given that firms in the technology and pharmaceutical industries employ more intangible assets and invest more in R&D activities, a longer-term orientation arguably matters more in the technology and pharmaceutical industries than in others. As such, we aim to analyze whether the

[12] Since our sample ends in 2016, we only cover the years from 2010 to 2016 in the 2010s.

effects of constituency statutes increase for, or are only present in, the firms in the technology and pharmaceutical industries.

2.5 Results

2.5.1 Constituency Statutes and Firm Horizon

We motivate our analysis by arguing that constituency statutes can encourage firms to manage for the long-term. Our premise is that the statutes explicitly permit managers to consider the long-term interests of the firm without having to worry about sacrificing short-term performance. In this section, we formally test the effect of constituency statutes on our measures of long-term orientation. The results are presented in Tables 2.3, 2.4 and 2.5.

We first examine whether constituency statutes change the executive horizon in decision making. Columns (1) and (2) of Table 2.3 present our results. We find that treated firms in the technology and pharmaceutical industries experience a 14.7 percentage point increase in *Executive Horizon*, and this effect is not significant for an average firm in the overall sample. *Executive Horizon* is defined as one minus the proportion of equity compensation that will be vested within the current year. Thus, economically this result indicates that during each year in our sample period after the adoption of constituency statutes, an average executive of a firm in the technology and pharmaceutical industries has an additional 14.7% share of his total compensation tied to the future performance in at least one year. This result suggests that constituency statutes help executives focus on longer-term issues through changes in the executive compensation structure, but this effect is concentrated only among firms in the technology and pharmaceutical industries.

Columns (3) and (4) of Table 2.3 present the results on shareholder composition. Column (3) shows that constituency statutes do not have a significant effect on *Transient Shareholder Percentage* for an average firm in the overall sample. However, Column (4) shows that compared to other industries, treated firms in the technology and pharmaceutical industries have a 1.1 percentage point decrease in *Transient Shareholder Percentage*, equivalent to a 3.7% (3.6%) decrease for an average (median) firm in our sample. This result implies that institutional shareholders of treated technology and pharmaceutical firms become longer-term oriented after the adoption of constituency statutes.

Table 2.4 reports the results for our different measures of earnings management. Columns (1), (3) and (5) show that for the overall sample neither discretionary accruals nor real earnings management experiences a significant change. However, both Columns (2) and (4) show that treated firms in the technology and pharmaceutical industries conduct less accrual-based earnings management compared to firms in other industries, no matter whether *Discretionary Accruals1* (balance sheet approach) or *Discretionary Accruals2* (cash flow approach) is used. Specifically, the 0.6 percentage point decrease in *Discretionary Accruals1* is equivalent to an 8.3% (13.2%) decrease for an average (median) firm in our sample, while the 0.8 percentage point decrease in *Discretionary Accruals2* is equivalent to a 15.2% (24.5%) decrease for an average (median) firm. For *Real Earnings Management*[13] in Column (6), although the interaction term is not significant, the negative sign is consistent with our expectation. The reduced earnings management behaviour of managers after the enactment of constituency statutes is also documented in Gao et al. (2020) and Ni (2020). However, we further show that this effect is concentrated among firms in the technology and pharmaceutical industries. Our results suggest that treated firms in the technology and pharmaceutical industries become longer-term oriented from the perspective of reduced earnings management behaviour.

Finally, Table 2.5 present results on long-term investments. Columns (1) and (2) show that all firms experience an increase in *Capital Expenditure* after the enactment of constituency statutes. Columns (3)-(6) further reveal that R&D expenditures increase after the enactment of constituency statutes, and this effect is mainly concentrated[14] among firms in the technology and pharmaceutical industries. In particular, for *R&D1* that includes 30% of SG&A, treated firms in the technology and pharmaceutical industries have an 8.9 percentage point increase compared to other industries, equivalent to a 25.4% increase in *R&D1* for an average firm in our sample. The

[13] In untabulated analysis, we also use two alternative measures of real earnings management, *REM1* and *REM2*. Following Cohen and Zarowin (2010), *REM1* is defined as the sum of negative abnormal discretionary expenses and positive abnormal production costs, and *REM2* is defined as the sum of negative abnormal discretionary expenses and negative abnormal operating cash flows. We find the coefficient for *REM2* is significantly negative for the overall sample.

[14] Although in Column (4) of Table 2.5 the coefficient on the constituency statutes dummy for the dependent variable *R&D1* is significantly positive, its magnitude is much smaller than the interaction term.

large economic magnitude is not surprising since firms in the technology and pharmaceutical firms are focused on intangible assets, which makes R&D their most important investment. Columns (9) and (10) show that *Standardized Investment SG&A*, which estimates the intangible investment proportion of SG&A, exhibits an increase for all firms in our sample. Although the interaction term with the technology and pharmaceutical industries is not significant, the positive sign is as expected. Overall, our results show that constituency statutes have a positive effect on different types of long-term investments for all firms, but the effect on R&D investment is especially concentrated among firms in the technology and pharmaceutical industries.

2.5.2 Does a Longer Firm Horizon Matter for Firm Value and Cash Flows?

We expect that a longer firm horizon, which is motivated by constituency statutes, should increase firm value, which is inherently a long-term concept.

Table 2.6 reports our results on firm value. Columns (1), (3) and (5) show that *Tobin's Q*, *Total Q* and *Enterprise Value Multiple* increase for an average firm in our sample after the enactment of constituency statutes. This finding is consistent with Cremers et al. (2019), who also show that firm value increases after the adoption of constituency statutes. However, our cross-sectional results in Columns (2), (4) and (6) show that the positive effect of constituency statutes on firm value is mainly concentrated among firms in the technology and pharmaceutical industries. In particular, compared to other industries, treated firms in the technology and pharmaceutical industries exhibit a 10.9 percentage point increase in *Tobin's Q*, equal to a 5.6% (7.7%) increase for an average (median) firm in our sample. The fact that we find an increase in firm value mainly for firms in these industries provides support for the notion that the longer firm horizon encouraged by the constituency statutes is an underlying channel, since a longer-term horizon matters the most for these firms. In a related work, Flammer and Bansal (2017) exploit the marginal pass or fail of shareholder proposals about long-term orientation, and also show that lengthening the firm horizon yields greater firm value.

Lastly, Table 2.7 presents our results on firm cash flows. Columns (2) and (4) show that after the enactment of constituency statutes, firms in other industries than the technologies and pharmaceuticals experience an increase in *Operating Cash Flow* but not in *EBITDA*. However, these two columns also show that firms in the technology and pharmaceutical industries exhibit a decrease in *Operating Cash Flow* and *EBITDA* on average during the sample period. This result is expected for two reasons: First, planning for the long-term is associated with making sacrifices in the short-term, otherwise all firms would adopt a longer-term orientation to increase firm value. As constituency statutes explicitly allow managers to consider a firm's long-term interests, this gives managers legal cover to protect themselves from potential liabilities due to short-term underperformance. Second, the decreasing cash flows could be a result of the increasing R&D investment documented above, since R&D investments are expensed. We find that firm cash flows decrease after the adoption of the constituency statutes, but we do not find constituency statutes have a significant effect on ROA during our sample period, as shown in Column (6). Overall, our results in Tables 2.6 and 2.7 suggest that for firms in the technology and pharmaceutical industries, lengthening the firm horizon increases firm value, but this comes at the expense of decreasing cash flows.

2.6 Robustness Checks

An assumption of our difference-in-differences identification strategy is that constituency statutes are randomly adopted and cannot be predicted by any economic, social, political or other factors in each state. The existing literature on constituency statutes has already verified this assumption. For example, Gao et al. (2020) use a Weibull hazard model to check whether the adoption of constituency statutes can be predicted by various factors, including state-level total GDP, total population, whether the state is governed by a Republican, unemployment rate, workforce education, and other state laws about anti-takeover defenses. However, none of these factors is related to the adoption of constituency statutes. In addition, Cremers et al. (2019) use a Cox hazard model and a linear probability model to check whether certain factors are related to the adoption of constituency statutes. Cremers et al. (2019) include state-level total GDP, GDP growth, the proportion of state Democratic representatives in the House of Representatives, total population, unemployment rate, the median Tobin's Q, stock returns and ROA across firms in a state, the percentage of union coverage and membership, M&A intensity and deal size, and also other state laws about anti-takeover defenses, wrongful discharge, disclosure and R&D tax credits. None of these factors can predict the adoption of constituency statutes. Collectively, these analyses mitigate our concern that constituency statutes are not randomly adopted.

We also check that our difference-in-differences identification strategy satisfies the parallel trends assumption. In particular, we examine the dynamics of the treatment effects to ensure there is no pre-existing trend in our dependent variables of interest prior to the enactment of the constituency statutes. A second aim of this analysis is to see whether there are any lagged treatment effects for our variables of interest. Table 2.8 presents the results of the dynamics of the treatment effects. We follow Cremers et al. (2019) and create several dummies to indicate the time relative to the constituency statutes: *Constituency Statute (-2 or -1)* indicate observations in one and two years prior to the enactment of the constituency statutes, *Constituency Statute (0)* indicates the year of the enactment, and *Constituency Statute (+1)*, *(+2)* and *(3+)* indicate observations in one, two, and three or more years after the enactment, respectively. We also add interaction terms with the technology and pharmaceutical industries in examining the pre-existing trends.

Panels A and B of Table 2.8 show that there is indeed no pre-existing trend in our variables including compensation-based executive horizon, shareholder composition, discretionary accruals and R&D investment, as well as our other variables. In addition, there is no pre-existing trend between the technology and pharmaceutical industries and other industries either[15]. These results alleviate the concern that the treatment and control groups, and also the technology and pharmaceutical industries and other industries already exhibit a difference before the enactment of constituency statutes. Interestingly, we also find that the increase in firm value including *Tobin's Q*, *Total Q* and *Enterprise Value Multiple* mainly show up in two or three years after the enactment of the constituency statutes. Several possible reasons could explain the delay in market response: First, as shown in Panel A, both *R&D1* and *R&D2* start to increase from the second year after the enactment of constituency statutes. As intangible investment, R&D expenditures could take time to yield profits and show up in market value. Second, the market could under-react to positive corporate actions, which is widely documented in the literature

[15] In Appendix we also run pre-trend analysis separately for the technology and pharmaceutical industries. The results are consistent with our pre-trend analysis with interactions, and we do not find any pre-existing trend in this analysis either.

(e.g., Eberhart et al., 2004; Daniel, Hirshleifer and Subrahmanyam, 1998; Ikenberry and Ramnath, 2002). In particular, Eberhart et al. (2004) find that the market under-reacts to R&D investment. Since the adoption of constituency statutes is random and the benefits of long-term corporate planning (not only R&D investment, but also other long-term oriented strategies) takes time to fully reveal itself, the market could be slow to recognize the value from a shift to a longer-term orientation. This lagged treatment effect provides further support for the idea that the underlying channel for the increase in firm value after the enactment of the constituency statutes is the longer firm horizon. In addition, we also find that treated firms in the technology and pharmaceutical industries experience a decrease in *Operating Cash Flow* and *EBITDA* from the third year after the enactment of constituency statutes. Notably, the decrease in cash flows begins one year after R&D investment starts to increase, which implies that the increasing R&D expenses contributes to the decreasing cash flows. The cash flow results suggest that planning for the long-term is associated with a short-term (or even longer) sacrifice in cash flows, and one of the destinations for the diverted cash flows is long-term investments such as R&D. Collectively, our results suggest that the shift to a longer-term orientation results in greater firm value, but this comes at the cost of decreasing cash flows.

2.7 Conclusion

Our study exploits an overlooked aspect of constituency statutes – an emphasis on the long-term interests of the firm – and examines whether the staggered enactment of the statutes in different U.S. states actually encourages firms to manage for the long-term. We find that the enactment of constituency statutes leads to a longer firm horizon. In particular, our results show that firms in the technology and pharmaceutical industries, for whom a longer-term orientation arguably matters the most, exhibit executive compensation contracts with longer vesting periods, a change in shareholder composition towards greater long-term institutional ownership, less earnings management, and more R&D investment after the enactment of constituency statutes. We further find that the shift to a longer-term orientation results in greater firm value, but this comes at the cost of decreasing cash flows. Overall, we contribute to the literature by showing that constituency statutes encourage firms to manage for the long-term, and this focus on long-termism benefits firms in the technology and pharmaceutical industries, but not others. Thus, lengthening the firm horizon is not a cure for all of Corporate America and the costs of short-termism may have been greatly exaggerated.

Table 2.1 Timeline of Constituency Statutes

This table reports the timeline of constituency statutes in different states in the U.S. The timeline is adapted from Table 2 in Karpoff and Wittry (2018).

State Name	Year
Arizona	1987
Connecticut	1988
Florida	1989
Georgia	1989
Hawaii	1989
Idaho	1988
Illinois	1985
Indiana	1986
Iowa	1989
Kentucky	1988
Louisiana	1988
Maine	1985
Maryland	1999
Massachusetts	1989
Minnesota	1987
Mississippi	1990
Missouri	1986
Nebraska	1988
Nevada	1991
New Jersey	1989
New Mexico	1987
New York	1987
North Carolina	1993
North Dakota	1993
Ohio	1984
Oregon	1989
Pennsylvania	1990
Rhode Island	1990
South Dakota	1990
Tennessee	1988
Texas	2006
Vermont	1998
Virginia	1988
Wisconsin	1987
Wyoming	1990

Table 2.2 Summary Statistics

This table reports descriptive statistics for all variables used in this paper. See Appendix for detailed definitions for all variables.

Variable	Obs.	Mean	SD	25%	Median	75%
Constituency Statute	104,383	0.253	0.435	0.000	0.000	1.000
Tobin's Q	104,383	1.938	1.551	1.070	1.421	2.144
Executive Horizon	29,029	0.417	1.558	0.147	0.658	1.000
Transient Shareholder Percentage	102,430	0.296	0.149	0.200	0.304	0.397
Discretionary Accruals1	99,911	0.070	0.079	0.020	0.044	0.088
Discretionary Accruals2	85,237	0.050	0.054	0.013	0.031	0.065
Real Earnings Management	77,806	-0.021	0.186	-0.105	-0.036	0.038
Size	104,383	5.241	2.053	3.756	5.112	6.602
Leverage	104,383	0.213	0.201	0.030	0.175	0.333
Institutional Ownership	104,383	0.375	0.291	0.113	0.322	0.610
Tangibility	104,383	0.265	0.222	0.089	0.204	0.381
Capital Expenditure	99,956	0.140	0.404	0.020	0.042	0.092
R&D1	104,046	0.349	1.343	0.047	0.088	0.179
R&D2	104,046	0.224	1.093	0.000	0.000	0.066
Investment SG&A	79,701	0.093	0.219	-0.020	0.060	0.177
Standardized Investment SG&A	79,701	-0.192	0.617	-0.469	-0.265	-0.053
Total Q	100,758	1.253	2.165	0.248	0.649	1.355
Enterprise Value Multiple	104,188	3.628	12.081	0.552	1.078	2.337
Operating Cash Flow	86,016	0.035	0.188	0.004	0.073	0.129
EBITDA	104,383	0.069	0.202	0.031	0.110	0.170
ROA	104,383	-0.029	0.230	-0.030	0.032	0.076

Table 2.3 Difference-in-differences Regressions for Executive and Shareholder Horizon

This table reports the coefficient estimates of constituency statutes and its interaction term with the technology & pharmaceutical industries. The dependent variables are *Executive Horizon* (columns 1-2) and *Transient Shareholder Percentage* (columns 3-4). All control variables are lagged by one year. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)
	Executive Horizon	Executive Horizon	Transient Shareholder Percentage	Transient Shareholder Percentage
Constituency Statute$_t$	-0.0027	-0.0305	0.0042	0.0069**
	(0.042)	(0.045)	(0.003)	(0.003)
Constituency Statute$_t$ * Tech&Pharma Industries		0.1472*		-0.0109**
		(0.079)		(0.004)
Size$_{t-1}$	-0.5181***	-0.5180***	-0.0056***	-0.0056***
	(0.033)	(0.033)	(0.001)	(0.001)
Leverage$_{t-1}$	0.3944***	0.3952***	-0.0037	-0.0037
	(0.043)	(0.043)	(0.004)	(0.004)
Institutional Ownership$_{t-1}$	-0.5456***	-0.5453***	0.0090**	0.0089**
	(0.064)	(0.064)	(0.004)	(0.004)
Tobin's Q$_{t-1}$	-0.1931***	-0.1931***	0.0023***	0.0023***
	(0.017)	(0.017)	(0.000)	(0.000)
ROA$_{t-1}$	-0.4630***	-0.4638***	0.0544***	0.0543***
	(0.047)	(0.047)	(0.008)	(0.008)
Tangibility$_{t-1}$	0.4253***	0.4233***	-0.0358***	-0.0359***
	(0.096)	(0.096)	(0.010)	(0.010)
Constant	4.6915***	4.6906***	0.3270***	0.3272***
	(0.243)	(0.244)	(0.004)	(0.004)
Firm FE	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes
Observations	28791	28791	101331	101331
Adjusted R^2	0.198	0.198	0.477	0.477

Table 2.4 Difference-in-differences Regressions for Earnings Management

This table reports the coefficient estimates of constituency statutes and its interaction term with the technology & pharmaceutical industries. The dependent variables are *Discretionary Accruals1* (columns 1-2), *Discretionary Accruals2* (columns 3-4), and *Real Earnings Management* (columns 5-6). All control variables are lagged by one year. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1) Discretionary Accruals1	(2) Discretionary Accruals1	(3) Discretionary Accruals2	(4) Discretionary Accruals2	(5) Real Earnings Management	(6) Real Earnings Management
Constituency Statute$_t$	-0.0006	0.0009	0.0015	0.0034**	0.0025	0.0069
	(0.001)	(0.001)	(0.002)	(0.001)	(0.004)	(0.005)
Constituency Statute$_t$ * Tech&Pharma Industries		-0.0058***		-0.0076***		-0.0176
		(0.002)		(0.002)		(0.013)
Size$_{t-1}$	-0.0103***	-0.0103***	-0.0099***	-0.0099***	-0.0562***	-0.0563***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)
Leverage$_{t-1}$	0.0472***	0.0472***	0.0044***	0.0044***	-0.0695***	-0.0695***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.007)	(0.007)
Institutional Ownership$_{t-1}$	-0.0028	-0.0029	-0.0021***	-0.0022***	0.0258***	0.0257***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.004)	(0.004)
Tobin's Q$_{t-1}$	0.0010***	0.0010***	0.0006***	0.0006***	0.0143***	0.0143***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA$_{t-1}$	-0.0393***	-0.0393***	-0.0172***	-0.0172***	-0.0236***	-0.0237***
	(0.003)	(0.003)	(0.001)	(0.001)	(0.008)	(0.008)
Tangibility$_{t-1}$	-0.0226***	-0.0226***	-0.0159***	-0.0159***	0.0156	0.0155
	(0.003)	(0.003)	(0.003)	(0.003)	(0.010)	(0.010)
Constant	0.1178***	0.1180***	0.1040***	0.1041***	0.2492***	0.2497***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.011)	(0.011)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	98891	98891	84156	84156	76752	76752
Adjusted R^2	0.257	0.257	0.324	0.324	0.385	0.385

Table 2.5 Difference-in-differences Regressions for Investments

This table reports the coefficient estimates of constituency statutes and its interaction term with the technology & pharmaceutical industries. The dependent variables are *Capital Expenditure* (columns 1-2), *R&D1* (columns 3-4), *R&D2* (columns 5-6), *Investment SG&A* (columns 7-8), and *Standardized Investment SG&A* (columns 9-10). All control variables are lagged by one year. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Capital Expenditure	Capital Expenditure	R&D1	R&D1	R&D2	R&D2	Investment SG&A	Investment SG&A	Standardized Investment SG&A	Standardized Investment SG&A
Constituency Statute$_t$	0.0263***	0.0230***	0.0504**	0.0290*	0.0175	-0.0025	0.0072	0.0029	0.0493***	0.0472**
	(0.008)	(0.008)	(0.023)	(0.016)	(0.013)	(0.010)	(0.007)	(0.006)	(0.017)	(0.019)
Constituency Statute$_t$ * Tech&Pharma Industries		0.0132		0.0887*		0.0826**		0.0165		0.0080
		(0.013)		(0.049)		(0.040)		(0.014)		(0.040)
Size$_{t-1}$	-0.0065***	-0.0064***	0.0052	0.0054	0.0248***	0.0250***	-0.0329***	-0.0329***	-0.0787***	-0.0787***
	(0.001)	(0.001)	(0.007)	(0.007)	(0.006)	(0.006)	(0.002)	(0.002)	(0.006)	(0.006)
Leverage$_{t-1}$	-0.1991***	-0.1991***	-0.5352***	-0.5347***	-0.3835***	-0.3831***	-0.0245***	-0.0245***	-0.0716***	-0.0716***
	(0.013)	(0.013)	(0.046)	(0.046)	(0.041)	(0.041)	(0.005)	(0.005)	(0.017)	(0.017)
Institutional Ownership$_{t-1}$	0.0031	0.0033	-0.0579**	-0.0570**	-0.0658***	-0.0649***	0.0042	0.0043	0.0704***	0.0704***
	(0.008)	(0.008)	(0.027)	(0.027)	(0.016)	(0.016)	(0.006)	(0.006)	(0.019)	(0.019)
Tobin's Q$_{t-1}$	0.0169***	0.0169***	0.0430***	0.0430***	0.0285***	0.0284***	0.0016***	0.0016***	0.0017	0.0017
	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.000)	(0.000)	(0.001)	(0.001)
ROA$_{t-1}$	-0.0667***	-0.0667***	-0.9466***	-0.9464***	-0.6824***	-0.6823***	-0.1518***	-0.1518***	-0.4069***	-0.4069***
	(0.008)	(0.008)	(0.039)	(0.039)	(0.042)	(0.042)	(0.009)	(0.009)	(0.026)	(0.026)
Tangibility$_{t-1}$	-0.1165***	-0.1163***	-0.4603***	-0.4589***	-0.2613***	-0.2600***	-0.0034	-0.0033	-0.0127	-0.0126
	(0.035)	(0.035)	(0.066)	(0.067)	(0.051)	(0.051)	(0.009)	(0.009)	(0.036)	(0.036)
Constant	0.2029***	0.2025***	0.4577***	0.4558***	0.1923***	0.1905***	0.2648***	0.2644***	0.1932***	0.1930***
	(0.011)	(0.011)	(0.032)	(0.032)	(0.023)	(0.023)	(0.007)	(0.007)	(0.031)	(0.031)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	98919	98919	102960	102960	102960	102960	78639	78639	78639	78639
Adjusted R^2	0.506	0.506	0.622	0.622	0.658	0.658	0.660	0.660	0.655	0.655

Table 2.6 Difference-in-differences Regressions for Firm Value

This table reports the coefficient estimates of constituency statutes and its interaction term with the technology & pharmaceutical industries. The dependent variables are *Tobin's Q* (columns 1-2), *Total Q* (columns 3-4), and *Enterprise Value Multiple* (columns 5-6). All control variables are lagged by one year. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)	(6)
	Tobin's Q	Tobin's Q	Total Q	Total Q	Enterprise Value Multiple	Enterprise Value Multiple
Constituency Statute$_t$	0.0328**	0.0062	0.0986***	0.0639*	0.4366**	0.1302
	(0.015)	(0.017)	(0.035)	(0.033)	(0.198)	(0.162)
Constituency Statute$_t$ * Tech&Pharma Industries		0.1092***		0.1399*		1.2571**
		(0.036)		(0.079)		(0.564)
Size$_{t-1}$	-0.3526***	-0.3523***	-0.2859***	-0.2856***	-0.4084***	-0.4052***
	(0.017)	(0.017)	(0.016)	(0.016)	(0.115)	(0.115)
Leverage$_{t-1}$	0.0487	0.0493	-0.2005***	-0.1996***	-3.3474***	-3.3406***
	(0.049)	(0.049)	(0.049)	(0.049)	(0.281)	(0.281)
Institutional Ownership$_{t-1}$	0.1855***	0.1866***	0.0540	0.0554	0.1635	0.1762
	(0.040)	(0.040)	(0.070)	(0.070)	(0.285)	(0.286)
Tobin's Q$_{t-1}$	0.1642***	0.1641***	0.2497***	0.2497***	0.5875***	0.5873***
	(0.015)	(0.015)	(0.017)	(0.017)	(0.046)	(0.046)
ROA$_{t-1}$	-0.0623**	-0.0620**	1.1328***	1.1332***	-4.3704***	-4.3666***
	(0.028)	(0.028)	(0.064)	(0.064)	(0.304)	(0.303)
Tangibility$_{t-1}$	-0.3951***	-0.3933***	-1.3484***	-1.3463***	-3.6619***	-3.6420***
	(0.065)	(0.065)	(0.105)	(0.106)	(0.745)	(0.753)
Constant	3.4601***	3.4577***	2.5970***	2.5934***	5.9596***	5.9323***
	(0.103)	(0.104)	(0.114)	(0.114)	(0.730)	(0.735)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	103287	103287	99728	99728	103094	103094
Adjusted R^2	0.600	0.600	0.542	0.542	0.560	0.560

Table 2.7 Difference-in-differences Regressions for Firm Cash Flows

This table reports the coefficient estimates of constituency statutes and its interaction term with the technology & pharmaceutical industries. The dependent variables are *Operating Cash Flow* (columns 1-2), *EBITDA* (columns 3-4), and *ROA* (columns 5-6). All control variables are lagged by one year. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)	(6)
	Operating Cash Flow	Operating Cash Flow	EBITDA	EBITDA	ROA	ROA
Constituency Statute$_t$	0.0046*	0.0106***	-0.0027	0.0002	-0.0025	-0.0011
	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
Constituency Statute$_t$ * Tech&Pharma Industries		-0.0233**		-0.0119**		-0.0058
		(0.010)		(0.005)		(0.007)
Size$_{t-1}$	0.0029***	0.0029***	-0.0051***	-0.0051***	-0.0210***	-0.0210***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Leverage$_{t-1}$	0.0442***	0.0441***	0.0591***	0.0590***	0.0189***	0.0189***
	(0.003)	(0.003)	(0.005)	(0.005)	(0.006)	(0.006)
Institutional Ownership$_{t-1}$	0.0187***	0.0185***	0.0048	0.0047	0.0184***	0.0183***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Tobin's Q$_{t-1}$	0.0018***	0.0018***	0.0030***	0.0030***	0.0042***	0.0042***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA$_{t-1}$	0.2397***	0.2396***	0.3021***	0.3021***	0.3257***	0.3257***
	(0.010)	(0.010)	(0.017)	(0.017)	(0.020)	(0.020)
Tangibility$_{t-1}$	0.0669***	0.0667***	0.0655***	0.0653***	-0.0239***	-0.0240***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)
Constant	-0.0126***	-0.0122***	0.0655***	0.0657***	0.0757***	0.0758***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)	(0.006)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	84902	84902	103287	103287	103287	103287
Adjusted R^2	0.632	0.632	0.681	0.681	0.549	0.549

Table 2.8 Dynamics of Treatment Effect of Constituency Statutes

Panel A.

This table reports the coefficient estimates of the dynamics of treatment effect of constituency statutes. The dependent variables are *Executive Horizon* (column 1), *Transient Shareholder Percentage* (column 2), *Discretionary Accruals1* (column 3), *Discretionary Accruals2* (column 4), *R&D1* (column 5), and *R&D2* (column 6). *Constituency Statute (-2 or -1)* indicate observations in one and two years prior to the enactment of constituency statutes, *Constituency Statute (0)* indicates the year of the enactment, and *Constituency Statute (+1)*, *(+2)* and *(3+)* indicate observations in one, two, and three or more years after the enactment respectively. All control variables are lagged by one year and are suppressed for brevity. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)	(6)
	Executive Horizon	Transient Shareholder Percentage	Discretionary Accruals1	Discretionary Accruals2	R&D1	R&D2
Constituency Statute (-2 or -1) * Tech&Pharma Industries	-0.2225	0.0009	0.0001	0.0032	0.1146	0.0819
	(0.151)	(0.014)	(0.003)	(0.007)	(0.085)	(0.070)
Constituency Statute (0) * Tech&Pharma Industries	-1.2050***	-0.0070	-0.0060	0.0011	0.0493	0.0402
	(0.236)	(0.010)	(0.007)	(0.006)	(0.058)	(0.050)
Constituency Statute (+1) * Tech&Pharma Industries	0.6128***	-0.0181	-0.0045	-0.0112**	0.0307	0.0378
	(0.153)	(0.012)	(0.007)	(0.005)	(0.033)	(0.030)
Constituency Statute (+2) * Tech&Pharma Industries	0.0531	-0.0263**	-0.0018	-0.0103**	0.1178*	0.1367**
	(0.855)	(0.011)	(0.006)	(0.005)	(0.062)	(0.056)
Constituency Statute (3+) * Tech&Pharma Industries	0.1324	-0.0098**	-0.0063***	-0.0067***	0.1194**	0.1053***
	(0.102)	(0.004)	(0.002)	(0.002)	(0.049)	(0.039)
Constituency Statute (-2 or -1)	-0.0640	0.0075	-0.0004	-0.0026	0.0036	-0.0086
	(0.076)	(0.008)	(0.002)	(0.003)	(0.034)	(0.027)
Constituency Statute (0)	-0.3568*	0.0139	-0.0001	0.0022	0.0219	0.0007
	(0.203)	(0.009)	(0.003)	(0.003)	(0.034)	(0.028)
Constituency Statute (+1)	-0.4426***	0.0100	0.0009	0.0003	-0.0058	-0.0227
	(0.135)	(0.008)	(0.003)	(0.002)	(0.037)	(0.030)
Constituency Statute (+2)	0.1215	0.0120	-0.0029	0.0030	0.0223	-0.0384
	(0.231)	(0.008)	(0.003)	(0.003)	(0.049)	(0.032)

Constituency Statute (3+)	-0.0318	0.0131*	0.0010	0.0022	0.0432	-0.0035
	(0.066)	(0.007)	(0.002)	(0.001)	(0.037)	(0.027)
Constant	4.6927***	0.3249***	0.1180***	0.1045***	0.4494***	0.1896***
	(0.247)	(0.004)	(0.003)	(0.002)	(0.034)	(0.023)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28791	101331	98891	84156	102960	102960
Adjusted R^2	0.199	0.477	0.257	0.324	0.622	0.658

Table 2.8 Dynamics of Treatment Effect of Constituency Statutes - continued

Panel B.

This table reports the coefficient estimates of the dynamics of treatment effect of constituency statutes. The dependent variables are *Tobin's Q* (column 1), *Total Q* (column 2), *Enterprise Value Multiple* (column 3), *Operating Cash Flow* (column 4), and *EBITDA* (column 5). *Constituency Statute (-2 or -1)* indicate observations in one and two years prior to the enactment of constituency statutes, *Constituency Statute (0)* indicates the year of the enactment, and *Constituency Statute (+1)*, *(+2)* and *(3+)* indicate observations in one, two, and three or more years after the enactment respectively. All control variables are lagged by one year and are suppressed for brevity. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)
	Tobin's Q	Total Q	Enterprise Value Multiple	Operating Cash Flow	EBITDA
Constituency Statute (-2 or -1) * Tech&Pharma Industries	-0.0242	0.0125	0.9850	-0.0159	-0.0097
	(0.074)	(0.123)	(0.728)	(0.014)	(0.010)
Constituency Statute (0) * Tech&Pharma Industries	-0.0607	-0.0352	0.7701	-0.0122	-0.0115
	(0.065)	(0.165)	(0.588)	(0.016)	(0.011)
Constituency Statute (+1) * Tech&Pharma Industries	0.0938	0.1216	1.3535**	-0.0185	0.0061
	(0.084)	(0.121)	(0.578)	(0.015)	(0.010)
Constituency Statute (+2) * Tech&Pharma Industries	0.1098	0.0849	1.2928	-0.0219	-0.0077
	(0.094)	(0.128)	(0.793)	(0.015)	(0.012)
Constituency Statute (3+) * Tech&Pharma Industries	0.1175***	0.1593*	1.5140***	-0.0293**	-0.0160**
	(0.041)	(0.093)	(0.556)	(0.012)	(0.006)
Constituency Statute (-2 or -1)	0.0937	0.0748	0.0524	0.0089**	0.0138**
	(0.058)	(0.090)	(0.319)	(0.004)	(0.005)
Constituency Statute (0)	0.0964*	0.1020	0.1114	0.0124	0.0201***
	(0.057)	(0.077)	(0.263)	(0.008)	(0.007)
Constituency Statute (+1)	0.0825	0.0855	0.1579	0.0149***	0.0150**
	(0.062)	(0.082)	(0.336)	(0.005)	(0.007)
Constituency Statute (+2)	0.0861	0.1665**	0.1310	0.0221***	0.0144**
	(0.061)	(0.082)	(0.425)	(0.005)	(0.006)
Constituency Statute (3+)	0.0763*	0.1288**	0.2165	0.0145***	0.0083

	(0.042)	(0.056)	(0.336)	(0.005)	(0.005)
Constant	3.4313***	2.5697***	5.8824***	-0.0131***	0.0627***
	(0.100)	(0.117)	(0.766)	(0.004)	(0.004)
Control Variables	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes
Observations	103287	99728	103094	84902	103287
Adjusted R^2	0.600	0.542	0.560	0.632	0.681

Appendix 2.1 Difference-in-differences Regressions for M&A Activities

This table reports the coefficient estimates of constituency statutes and its interaction term with the technology & pharmaceutical industries. The dependent variables are *Acquired* (columns 1-2), and *Acquired in Hostile Bid* (columns 3-4). All control variables are lagged by one year. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)
	Acquired	Acquired	Acquired in Hostile Bid	Acquired in Hostile Bid
Constituency Statute$_t$	0.0000	0.0003	0.0002	0.0002
	(0.001)	(0.001)	(0.000)	(0.000)
Constituency Statute$_t$ * Tech&Pharma Industries		-0.0011		0.0002
		(0.002)		(0.000)
Size$_{t-1}$	-0.0007	-0.0007	-0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage$_{t-1}$	0.0020*	0.0020*	-0.0002	-0.0002
	(0.001)	(0.001)	(0.000)	(0.000)
Institutional Ownership$_{t-1}$	0.0095***	0.0095***	0.0001	0.0001
	(0.001)	(0.001)	(0.000)	(0.000)
Tobin's Q$_{t-1}$	-0.0002***	-0.0002***	-0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)
ROA$_{t-1}$	-0.0009	-0.0009	0.0001	0.0001
	(0.001)	(0.001)	(0.000)	(0.000)
Tangibility$_{t-1}$	0.0016	0.0016	-0.0002	-0.0002
	(0.002)	(0.002)	(0.000)	(0.000)
Constant	0.0040*	0.0040*	0.0002	0.0002
	(0.002)	(0.002)	(0.000)	(0.000)
Firm FE	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes
Observations	103287	103287	103287	103287
Adjusted R^2	0.085	0.085	0.075	0.075

Appendix 2.2 Difference-in-differences Regressions for M&A Offer Premium

This table reports the coefficient estimates of constituency statutes and its interaction term with the technology & pharmaceutical industries. The dependent variables are *1-Day Premium* (columns 1-2), and *1-Week Premium* (columns 3-4), and *4-Week Premium* (column 5-6). All control variables are lagged by one year. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)	(6)
	1-Day Premium	1-Day Premium	1-Week Premium	1-Week Premium	4-Week Premium	4-Week Premium
Constituency Statute$_t$	0.0196	0.0321	0.0066	0.0186	0.0132	0.0222
	(0.028)	(0.030)	(0.026)	(0.030)	(0.032)	(0.036)
Constituency Statute$_t$ * Tech&Pharma Industries		-0.0543		-0.0521		-0.0391
		(0.055)		(0.054)		(0.048)
Size$_{t-1}$	-0.0062	-0.0067	-0.0049	-0.0053	-0.0191**	-0.0195**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Leverage$_{t-1}$	-0.0158	-0.0143	0.0110	0.0124	0.0231	0.0242
	(0.036)	(0.037)	(0.042)	(0.043)	(0.045)	(0.046)
Institutional Ownership$_{t-1}$	-0.0443	-0.0444	-0.0726**	-0.0728**	-0.0877*	-0.0878*
	(0.035)	(0.035)	(0.030)	(0.030)	(0.046)	(0.046)
Tobin's Q$_{t-1}$	-0.0144***	-0.0143***	-0.0190***	-0.0188***	-0.0341***	-0.0340***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)
ROA$_{t-1}$	-0.1384**	-0.1383**	-0.2008***	-0.2007***	-0.2500***	-0.2500***
	(0.064)	(0.063)	(0.057)	(0.057)	(0.061)	(0.061)
Tangibility$_{t-1}$	-0.0661	-0.0661	-0.1011**	-0.1011**	-0.0666	-0.0666
	(0.053)	(0.053)	(0.049)	(0.049)	(0.050)	(0.050)
Constant	0.1449***	0.1467***	0.1662***	0.1679***	0.2480***	0.2493***
	(0.041)	(0.042)	(0.045)	(0.046)	(0.049)	(0.049)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7001	7001	7001	7001	7001	7001
Adjusted R^2	0.190	0.190	0.190	0.190	0.188	0.188

Appendix 2.3 Dynamics of Treatment Effect of Constituency Statutes

Panel A.

This table reports the coefficient estimates of the dynamics of treatment effect of constituency statutes for the subsample of the technology & pharmaceutical industries. The dependent variables are *Executive Horizon* (column 1), *Transient Shareholder Percentage* (column 2), *Discretionary Accruals1* (column 3), *Discretionary Accruals2* (column 4), *R&D1* (column 5), and *R&D2* (column 6). *Constituency Statute (-2 or -1)* indicate observations in one and two years prior to the enactment of constituency statutes, *Constituency Statute (0)* indicates the year of the enactment, and *Constituency Statute (+1)*, *(+2)* and *(3+)* indicate observations in one, two, and three or more years after the enactment respectively. All control variables are lagged by one year and are suppressed for brevity. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects except for column 1. Due to a shrunk sample size, we do not include firm fixed effects in column 1 to allow for enough temporal variation in the firm level. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)	(6)
	Executive Horizon	Transient Shareholder Percentage	Discretionary Accruals1	Discretionary Accruals2	R&D1	R&D2
Constituency Statute (-2 or -1)	-0.1459	0.0151	-0.0011	-0.0005	0.1267	0.1260
	(0.107)	(0.018)	(0.006)	(0.005)	(0.205)	(0.161)
Constituency Statute (0)	-1.5641***	0.0197	-0.0078	-0.0043	0.0719	0.1234*
	(0.311)	(0.020)	(0.008)	(0.007)	(0.088)	(0.066)
Constituency Statute (+1)	0.5589	-0.0010	-0.0120*	-0.0157***	0.0464	0.0818
	(0.546)	(0.020)	(0.007)	(0.004)	(0.128)	(0.117)
Constituency Statute (+2)	0.1519	-0.0183	-0.0088	-0.0106	0.0653	0.1136
	(0.404)	(0.015)	(0.009)	(0.007)	(0.142)	(0.119)
Constituency Statute (3+)	0.1194***	0.0062	-0.0098**	-0.0068	0.0807	0.0876
	(0.032)	(0.015)	(0.004)	(0.004)	(0.088)	(0.076)
Constant	1.3330***	0.3817***	0.1278***	0.1115***	0.5734***	0.4102***
	(0.089)	(0.007)	(0.004)	(0.003)	(0.092)	(0.074)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8184	28207	28341	27697	28334	28334
Adjusted R^2	0.185	0.454	0.244	0.272	0.642	0.664

Appendix 2.3 Dynamics of Treatment Effect of Constituency Statutes - continued

Panel B.

This table reports the coefficient estimates of the dynamics of treatment effect of constituency statutes for the subsample of the technology & pharmaceutical industries. The dependent variables are *Tobin's Q* (column 1), *Total Q* (column 2), *Enterprise Value Multiple* (column 3), *Operating Cash Flow* (column 4), and *EBITDA* (column 5). *Constituency Statute (-2 or -1)* indicate observations in one and two years prior to the enactment of constituency statutes, *Constituency Statute (0)* indicates the year of the enactment, and *Constituency Statute (+1)*, *(+2)* and *(3+)* indicate observations in one, two, and three or more years after the enactment respectively. All control variables are lagged by one year and are suppressed for brevity. All regressions include firm, state (of location) by year, and industry (Fama-French 12 industries) by year fixed effects. Singleton observations are dropped in regressions due to fixed effects (Correia, 2015). Robust standard errors are clustered at firm's incorporation state level and are reported in parentheses below the coefficient estimates. ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively. See Appendix for detailed definitions for all variables.

	(1)	(2)	(3)	(4)	(5)
	Tobin's Q	Total Q	Enterprise Value Multiple	Operating Cash Flow	EBITDA
Constituency Statute (-2 or -1)	0.2162	0.2834*	1.2860	0.0030	0.0009
	(0.134)	(0.166)	(2.114)	(0.018)	(0.018)
Constituency Statute (0)	0.0703	0.1944	0.8492	0.0154	0.0134
	(0.120)	(0.201)	(1.394)	(0.015)	(0.017)
Constituency Statute (+1)	0.1373	0.1902	1.2016	0.0060	0.0207
	(0.143)	(0.186)	(1.337)	(0.018)	(0.018)
Constituency Statute (+2)	0.2084*	0.3055**	0.4787	0.0152	0.0066
	(0.110)	(0.150)	(1.259)	(0.013)	(0.016)
Constituency Statute (3+)	0.2221**	0.3970***	1.1029	0.0003	0.0005
	(0.088)	(0.115)	(0.924)	(0.012)	(0.014)
Constant	4.9142***	3.7396***	9.1269***	-0.0529***	-0.0019
	(0.092)	(0.181)	(1.589)	(0.008)	(0.013)
Control Variables	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes
State-by-Year FE	Yes	Yes	Yes	Yes	Yes
Observations	28555	28498	28481	27903	28555
Adjusted R^2	0.546	0.503	0.554	0.654	0.698

Appendix 2.4 Variable Definitions

Variable	Definition
Constituency Statute	The dummy is equal to one if the state *s* where firm *i* incorporates has adopted constituency statute in year *t*; equal to zero if firm *i*'s incorporation state *s* has not yet adopted its constituency statute in year *t* but will adopt it sometime in later years, or firm *i*'s incorporation state *s* has never passed constituency statute.
Executive Horizon	Following Gopalan et al. (2014) and Gao (2010), $\text{Vested Equity}_t = \text{Unvested Equity}_{t-1} + \text{Equity Grant}_t - \text{Unvested Equity}_t$ Vested Equity_t is the executive's value of restricted options and stocks that become vested in year *t*, $\text{Unvested Equity}_{t-1}$ is the executive's value of restricted options and stocks that are unvested in year *t-1*, Unvested Equity_t is the executive's value of restricted options and stocks that are unvested in year *t*, Equity Grant_t is the executive's value of restricted options and stocks that are newly granted in year *t*. All variables are scaled by the executive's total compensation in year *t*, which is the sum of salary, bonus, total value of stock options, total value of restricted stock granted, long-term incentive plan payouts, and all other forms of compensation. The horizon of one executive is defined as $1 - \text{Vested Equity}_t$. Following Bergstresser and Philippon (2006), Peng and Röell (2008) and Erickson et al. (2006), we take the average horizon of the five most highly compensated executives as the horizon of the executive team. Source: ExecuComp
Discretionary Accruals1	The absolute value of discretionary accruals estimated by the modified Jones (1991) model. Source: Compustat
Discretionary Accruals2	The absolute value of discretionary accruals estimated by the modified Jones (1991) model, in which the total accruals is calculated using the cash flow approach in Hribar and Collins (2002). Source: Compustat
Real Earnings Management	We estimate the abnormal operating cash flow, the abnormal production costs, and the abnormal discretionary expenses following Cohen, Dey and Lys (2008). Real earnings management is defined as the sum of the abnormal operating cash flow, the abnormal production costs, and the abnormal discretionary expenses. Source: Compustat
Transient Shareholder Percentage	The percentage of transient institutional shareholders among all types of institutional shareholders (transient, dedicated, and quasi-indexers) defined in Bushee (1998) and Bushee and Noe (2000). Source: publicly available from Brian Bushee's website.
Capital Expenditure	The capital expenditures scaled by total sales. Source: Compustat
R&D1	The sum of the R&D expense, the in-process R&D expense and 30% of the adjusted SG&A, scaled by total sales. The adjusted SG&A is defined as the SG&A originally reported in Compustat minus the R&D expense and the in-

	process R&D expense. If R&D expense is larger than the original SG&A but smaller than COGS, then the adjusted SG&A is equal to the original SG&A. The definition follows Peters and Taylor (2017). Source: Compustat
R&D2	The R&D expense scaled by total sales. Source: Compustat
Investment SG&A	The intangible investment proportion of the SG&A estimated by the Enache and Srivastava (2018) model. Source: Compustat
Standardized Investment SG&A	The *Investment SG&A* standardized by each industry-year as in Enache and Srivastava (2018). Source: Compustat
Tech & Pharma Industries	We assign the following SIC codes as the technology and pharmaceutical industries: 283, 357, 366, 367, 382, 384 and 737, following Brown et al. (2009), Martinsson (2010) and Borisova et al. (2013). Source: Compustat
Tobin's Q	Market value of the firm (market value of equity plus book value of total assets minus book value of equity) divided by the replacement cost of the firm (book value of total assets). Source: Compustat
Total Q	The Q proxy that additionally considers the intangible capital in the replacement cost of the total capital, defined in Peters and Taylor (2017). Source: The *Peters and Taylor Total Q* dataset in WRDS
Enterprise Value Multiple	The enterprise value is defined as the market value of equity plus total debt (short-term and long-term debt) plus preferred stock value minus cash and short-term investments. The enterprise value is scaled by total sales. Source: Compustat
Operating Cash Flow	The net cash flow from operating activities scaled by book value of total assets. Source: Compustat
EBITDA	The earnings before interest, taxes, depreciation and amortization scaled by book value of total assets. Source: Compustat
ROA	Net income scaled by book value of total assets. Source: Compustat
Size	The natural logarithm of book value of total assets. Source: Compustat
Leverage	The sum of total short-term debt and total long-term debt divided by book value of total assets. Source: Compustat
Institutional Ownership	The percentage of shares held by institutional investors. Source: Thomson Reuters 13f.
Tangibility	The total net property, plant and equipment scaled by book value of total assets. Source: Compustat
Acquired	The dummy is equal to one if a firm receives an M&A bid and subsequently completes the M&A, as indicated by the delisting status of CRSP. Source: Thomson Reuters SDC, CRSP.
Acquired in Hostile Bid	The dummy is equal to one if a firm receives a hostile M&A bid and subsequently completes the M&A, as indicated by the delisting status of CRSP. Source: Thomson Reuters SDC, CRSP.

1-Day Premium	The logarithm percentage difference between the offer price and the close price of the target firm 1 day before the M&A announcement date. Source: Thomson Reuters SDC, CRSP.
1-Week Premium	The logarithm percentage difference between the offer price and the close price of the target firm 1 week before the M&A announcement date. Source: Thomson Reuters SDC, CRSP.
4-Week Premium	The logarithm percentage difference between the offer price and the close price of the target firm 4 weeks before the M&A announcement date. Source: Thomson Reuters SDC, CRSP.

Chapter 3 Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash

3.1 Introduction

The predominant view of socially responsible firms is that they maximize shareholder welfare by engaging in environmental, social, and governance (ESG) activities (e.g., McWilliams and Siegel 2001). This view is often summarized as "doing well by doing good": ESG activities are good for shareholders, while striving for big social goals. The opposite view on ESG activities is predicated on the notion, usually attributed to Friedman (1970), that those activities are just a manifestation of managerial agency problems between shareholders and managers. In this view, managers engage in ESG activities that will generate benefits to them at the expense of shareholders.[16]

For quite some time now, practitioners have taken the view that ESG activities create value for firms and their shareholders. For example, McKinsey's 2019 Global Survey on ESG programs reports that a large majority of executives and investment professionals agree that ESG policies increase shareholder value (McKinsey & Company 2020). The same was true already in their 2009 survey. The academic literature has shown a positive association between ESG and financial performance.[17] The difficulty, though, lies in identifying the direction of causality and the underlying mechanisms: is it the case that firms with strong financial performance can afford to engage in ESG activities, or is it that ESG activities add value to shareholders? This paper addresses the empirical challenge by positing that the COVID-19 pandemic is an exogenous shock that allows us to study the causal link from ESG to financial performance.[18]

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[16] Benabou and Tirole (2010) discuss three possible views of corporate ESG activities: ESG activities motivate firms to adopt a longer-term perspective; ESG activities are delegated prosocial behaviors; and ESG activities are insider-initiated corporate philanthropy.

[17] See, for example, the meta-analyses of ESG activities and financial performance by Orlitzky, Schmidt, and Rynes (2003), Margolis, Elfenbein, and Walsh (2010), and Busch and Friede (2018).

[18] The *Financial Times* Alphaville column (April 2, 2020) labels the COVID-19 pandemic as the "ESG acid test" (Powell 2020).

We argue that the COVID-19 pandemic presents an unparalleled shock. First, the COVID-19 crisis and the subsequent economic lockdown is an unexpected shock to global stock markets. Second, it is an exogenous shock that originated out of public health concerns, not because of economic conditions. Third, the pandemic resulted in a stock market crash. The stock market in the United States peaked on February 19, and a mere month later prices had declined by almost 30%. The unexpected and exogenous nature of the shock and its speed suggest that firms had very limited ability to respond in a timely fashion to the unfolding crisis. Thus, the stock market reacted mostly to firms' preexisting conditions that affected their ability to endure the crisis. Overall, these aspects of the crisis create the opportunity for an event study that uses a very narrow window of time to test the causal link between ESG and firm value.

To understand why the COVID-19 shock is useful to study the ESG-financial performance link, consider the following two theories of ESG activities based on customer and investor preferences. Albuquerque, Koskinen, and Zhang (2019) present a model where firms invest in ESG policies as a product differentiation strategy (e.g., Patagonia uses only organic cotton in its outdoor clothing and supports conservation efforts; Apple is switching to 100% renewable energy; and TOMS donates a pair of shoes for every pair bought). The benefit of this strategy is a more loyal customer base and a lower price-elasticity of demand for their products. A less price-elastic demand gives the firm the ability to charge higher prices and have higher profit margins. In their model, the higher profit margin lowers operating leverage and thus systematic risk, and increases firm value. If the COVID-19 shock affects consumer demand, customer loyalty for ESG firms is hypothesized to benefit ESG firms' stock performance and resiliency.

The literature on sustainable and responsible investments (SRI) provides another hypothesis of how the COVID-19 shock affects the ESG-financial performance link. This literature has shown that ESG investors—investors with a preference for ESG stocks—are less sensitive to SRI funds' performance relative to conventional mutual funds' performance (Bollen 2007; Renneboog, Ter Horst, and Zhang 2011).[19] If the COVID-19 shock affects an investor's attitude toward risk, with many investors selling their holdings, the SRI literature suggests that ESG investors are more

[19] Using data from Morningstar on the sustainability of mutual funds to explore how fund investments are allocated, Hartzmark and Sussman (2019) show evidence that investors value sustainability due to nonfinancial motives and biases in performance expectations.

resilient compared to investors in other stocks.[20] Heinkel, Kraus, and Zechner (2001) develop a model of segmented capital markets based on investor preferences where a polluting firm, held by only a subset of investors, is less diversified and therefore carries greater systematic risk relative to other firms. Consequently, green firms, arguably firms with high ESG ratings, have higher valuations. If the COVID-19 shock led investors to flee the market, but less so for those ESG investors, then the price of ESG stocks should not decline as much, relative to the price of other stocks.

These two theories predict that stocks with high ESG ratings are more resilient relative to other stocks in the rampant stock market sell-off during the first quarter of 2020. Each theory offers a specific, though not necessarily mutually exclusive, mechanism that we also test in this paper.

We focus on the environmental and social (ES) aspects of ESG to avoid capturing a governance effect. Consistent with the paper's main prediction, our first result is that first quarter abnormal returns are significantly correlated with ES ratings in the cross-section, even after controlling for the usual firm characteristics, including size, cash to assets, Tobin's q, dividend yield, volatility, leverage, and industry. Next, we examine more closely the relation between the returns for firms with high ES ratings and the COVID-19 pandemic by using daily data and conducting a difference-in-differences analysis inside the first quarter of 2020. We estimate a difference-in-differences regression of firm-level daily abnormal returns with a COVID-19 event date of February 24,[21] when the stock market decline accelerated. We include a second event date of March 18, when President Trump signed the second Coronavirus Emergency Aid Package, which is the start of an aggressive fiscal and monetary policy response to the pandemic. We control for the second event because we wish to have a cleaner identification of the effect of the COVID-19 pandemic. We add firm and day fixed effects to control for any other unobservable effects, and cluster the standard errors by firm and day. We find that firms with high ES ratings earn an extra daily return of 0.45% from February 24 until March 17 relative to firms with low ES ratings, for a cumulative difference of 7.2%. We conduct a formal test of parallel trends, and do not reject the parallel trends assumption.

[20] In fact, the *Financial Times* reports increasing fund flows into ESG ETFs at the same time that conventional equity ETFs experience declining inflows and even outflows in the United States (Tett et al. 2020).

[21] The S&P 500 peaked on February 19, 2020. On Friday, February 21, several municipalities in Northern Italy entered lockdown, and the subsequent decline in the S&P 500 accelerated.

We complement the difference-in-differences regressions with a less parametric study of the relation between the returns to ES ratings and the COVID-19 pandemic. Following Ramelli and Wagner (2020), we estimate daily cross-sectional regressions of cumulative abnormal returns of U.S.-listed firms and inspect the evolution of the loading on ES ratings over time. We find that the loading on ES ratings is flat from January 1, 2020, until the end of February, which suggests no significant return difference between high- and low-ES firms prior to the COVID-19 shock and, as a by-product, supports the parallel trends assumption. The loading on ES ratings then steadily increases until it plateaus around mid-March, consistent with ES stocks being more resilient during the COVID-19 market crash.

Consistent with the resiliency hypothesis, we also document that high ES-rated firms display lower volatility of stock returns during the first quarter of 2020. We do this two ways. First, we compute the standard deviation of daily log returns, raw and capital asset pricing model (CAPM) adjusted, for the first quarter of 2020 and use cross-sectional regression models to study the effect of ES policies on volatility. Second, we use a range-based volatility measure (the daily high price minus the daily low price divided by the average price) and estimate difference-in-differences regressions using daily data. We find that volatility is lower for highly rated ES firms under both approaches and for the various measures of volatility.

Next, we study the operating performance of firms with high ES ratings relative to other firms during the first quarter of 2020. In contrast to stock returns, accounting numbers will take some time to fully reflect the worsening economic situation and firms' response to it. This analysis is thus just a first step to a more in depth study as additional data become available. We find that firms with high ES ratings realize higher operating profit margins in the first quarter of 2020 relative to the last quarter of 2019 viz-à-viz other firms, consistent with predictions from Albuquerque, Koskinen, and Zhang (2019). We also find that asset turnover (i.e., ratio of sales to assets) is lower for firms with high ES ratings relative to other firms during the period. High ES firms appear to have been able to increase their margins even as sale proceeds declined. Finally, we find no difference in return on assets for firms with high ES ratings relative to other firms during the first quarter of 2020.

To answer the question of how ES policies help build resiliency, we further investigate the two theories of customer and investor loyalty presented above. In Albuquerque, Koskinen, and Zhang (2019), ES is a product differentiation strategy. Since some markets are more competitive than others, we use advertising expenditures as a way to capture firms' ability to acquire customer loyalty. We therefore expect stronger results for firms with both high ES and advertising expenditures. We show that the effect on stock returns is twice as large for firms with high ES ratings coupled with high advertising expenditures compared to firms with high ES ratings but low advertising. This evidence is consistent with prior research (Servaes and Tamayo 2013; Albuquerque, Koskinen, and Zhang 2019). To test the investor loyalty mechanism, we construct a variable that measures the ES preferences of institutional investors. If firms with high ES ratings have owners with a preference for those stocks, then these firms should perform relatively better during a market sell-off. We find a positive, but insignificant effect of investor preferences on stock returns. Economically, the effect from investor preferences is about half the size of the effect from advertising expenditures. We note that these results are obtained in difference-in-differences regressions where we include firm and day fixed effects to control for unobserved constant effects, and also cluster standard errors by firm and day.

We also test the ability of these variables to explain the changes in the volatility of stock returns. We find a strong negative effect of investor preferences on range-based volatility in firms with high ES ratings. In contrast, our results show a negative, but insignificant effect on volatility for firms with high ES ratings coupled with high advertising expenditures. Overall, our evidence suggests that both mechanisms affect the return performance of high ES firms, relative to other firms (consistent with the findings in Gantchev, Giannetti, and Li 2019). Customer loyalty, however, is a more important factor in explaining the level of stock returns, besides being consistent with the operating profit margin results, whereas investor ES preferences is a more important factor for the volatility of stock returns.

Because of ESG ratings disagreements between different rating agencies (e.g. Berg, Koelbel, and Rigobon 2020), we use ES ratings from Thomson Reuters Refinitiv for our main results, but we find similar results using MSCI ES scores. One alternative explanation for our main finding is that the oil price decline in the first quarter of 2020 affected particularly firms in the energy sector, which are known to score low in some dimensions of ES. We repeat the analysis excluding firms in the energy sector from our sample. We find even stronger results. Another alternative explanation is that some businesses were considered "essential" and kept on operating in a normal fashion. We show that the documented resiliency of high ES-rated firms applies also within each industry, ruling out the essential-firms argument. It is also plausible that our results are driven by corporate governance, since Ferrell, Liang, and Renneboog (2016) show that well-governed firms invest more in ES policies. However, we show that our results for ES stocks cannot be explained by a good corporate governance effect.

Stocks with high ES ratings were not the only stocks to perform better during the first quarter of 2020. Acharya and Steffen (2020) provide evidence that firms with access to liquidity perform better during the first quarter. Ramelli and Wagner (2020) show that nonfinancial firms with higher cash holdings and lower financial leverage are less affected than other firms. Similar evidence is also provided by Fahlenbrach, Rageth, and Stulz (2020). Alfaro et al. (2020) and Hassan et al. (2020) show that stocks that are less exposed to the COVID-19 pandemic perform better. Pagano, Wagner, and Zechner (2020) demonstrate that firms that are less affected by social distancing have higher returns during the crisis. Landier and Thesmar (2020) demonstrate that changes in analysts' forecasts about future corporate earnings explain the overall decline, but not the short-term price movements, in stock prices during COVID-19. Shan and Tang (2020) document that Chinese firms with greater employee satisfaction appear to endure the COVID-19 stock market downturn better than other firms, supporting employee satisfaction as one dimension of ES policies creating shareholder value (Edmans 2011). In a cross-country analysis, Ding et al. (2020) provide evidence that firms with stronger balance sheets, less exposure to COVID-19, and more sustainable operations perform better during the first quarter. Cheema-Fox et al. (2020) show that firms that protect their workforce and supply chains during the stock market collapse have higher returns than other firms.

In addition to affecting stock prices, COVID-19 dramatically affected corporate financing. Li, Strahan, and Zhang (2020) document an unprecedented increase in commercial and industrial loans in banks' balance sheets, as nonfinancial corporations draw funds from credit lines during the three last weeks in March. Halling, Yu, and Zechner (2020) present evidence that bond issuance increases significantly after the middle of March, especially for highly rated bonds. Firms choose to issue bonds with longer maturities, perhaps anticipating that cash flows will be low for a long time.

Several recent papers have asserted a positive causal link from ESG activities to firms' financial performance. El Ghoul et al. (2011) employ instrumental variables estimation and dynamic panel data methods to show causality from ESG activities to lower cost of capital. Albuquerque, Koskinen, and Zhang (2019) similarly use instrumental variables estimation to demonstrate a causal link from ESG to reduced systematic risk and increased valuations. Dimson, Karakas, and Li (2015) and Krüger (2015) use event-study analyses to link ESG events to subsequent firm financial performance; their method alleviates concerns about reverse causality and omitted variables. Flammer (2015) employs the regression discontinuity design to show that successful shareholder ESG proposals result in positive abnormal returns. Masulis and Reza (2015), however, use the 2003 Tax Reform Act, which reduced personal tax rates on dividends, as an exogenous event to show that corporate giving—a component of ESG policies—reduces shareholder wealth. Their findings support the agency costs viewpoint.

In their paper studying the Great Recession of 2008–2009, a major economic shock, Lins, Servaes, and Tamayo (2017) show that U.S. nonfinancial firms with high ES ratings had better financial performance than other firms.[22] The current crisis is very different from the Great Recession for the speed and nature of the shock. In the 2-year duration of the Great Recession, firms had plenty of opportunities to adjust to the crisis and new government policies.[23] Thus, the Great Recession is a noisier setting in which to identify the effect of ESG on stock market performance because of the length of the economic shock. Second, the current shock is an unpredictable public health shock that is exogenous to the U.S. economy. In contrast, the Great Recession was economically driven and its origins in the financial sector led to widely held mistrust for financial firms. A confounding effect between ES policies and trust potentially limits our ability to discern whether the good performance of firms with high ES ratings in 2007–2008 is attributable to ES policies or to trust in general.

[22] Cornett, Erhemjamts, and Tehranian (2016) show that U.S. banks' financial performance during the Great Recession is positively related to their ESG score.
[23] Dai, Rau, and Tan (2020) demonstrate that firms increase their ESG scores during times of heightened uncertainty about economic policy conditions.

3.2 Data and Methodology

3.2.1 Sample and Summary Statistics

Our main data source on firms' ES performance is Thomson Reuters' Refinitiv ESG database. We include all U.S. stocks in the Refinitiv database. Refinitiv collects information from corporate annual reports, sustainability reports, nongovernmental organizations, and news sources for publicly traded companies at an annual frequency. Refinitiv ESG evaluates firms' environmental (E) performance in three categories: resource use, emissions, and innovation. Social (S) commitments are measured in four areas: workplace, human rights, community, and product responsibility. Governance (G) is evaluated in three dimensions: management, shareholders, and corporate social responsibility strategy. Each subcategory contains several ESG themes. For example, the resource use category contains four themes: water, energy, sustainable packaging, and environmental supply chain. The emission category covers themes of CO_2 emissions, waste, biodiversity, and environmental management systems. The ESG subcategory on workforce includes four themes: diversity and inclusion; career development and training; working conditions; and health and safety. The scores are based on the relative performance and materiality of ESG factors within the firm's sector (for E and S) and country (for G) and range from 0 to 100. Thomson Reuters' Refinitiv ESG scores have been used in the prior literature (e.g., Ferrell, Liang, and Renneboog 2016; Dyck et al. 2019). Our main measure, ES, is the average of the environment and social scores in 2018, expressed as a percentage. We thus omit the governance score.

We obtain daily stock returns from Capital IQ North America Daily for the first quarter of 2020 and CRSP from 2017 to 2019. The daily abnormal return is estimated as the difference between the daily logarithm return (i.e., the logarithm of gross return) of a stock and the CAPM beta times the daily logarithm return of the market.[24] The CAPM beta is estimated using daily returns from 2017 and 2019, and the S&P 500 as the market index. Similarly, the quarterly abnormal return is the difference between the logarithm of the stock's gross quarterly return and the

[24] Our results are similar if we use arithmetic returns instead.

CAPM beta times the logarithm of the market's gross quarterly return. We then calculate the volatility of stock returns, both raw and CAPM adjusted.

Accounting data for 2019 are obtained from Compustat and are used to construct control variables, namely, *Tobin's q*, *Size*, *Cash*, *Leverage*, *Return on equity*, *Advertising*, and *Dividend yield*. We winsorize all accounting variables at the 1% level in each tail. The appendix defines all variables used in the paper. After matching all data sets, our sample consists of 134,689 firm-day return observations for 2,171 distinct firms. Table 3.1 presents summary statistics.

We construct a firm-level investor ES measure based on institutional investors revealed preferences. Investors' ES preference is estimated using institutional investors' equity holdings, following recent studies (Starks, Venkat, and Zhu 2018; Gibson et al. 2019). We measure institutional ownership using Thomson Reuters' 13F database, which reports institutional investors' equity holdings. We merge the 13F investor holding data with Refinitiv ESG data for U.S. stocks. To construct the measure, we first measure an investor's ES preference as the value-weighted average Refinitiv ES score of its portfolio holdings for each quarter in 2018 and then average across the four quarters.[25] Investor-based ES score of a firm is measured as the weighted average of its investors' ES preference based on first quarter of 2019 holdings. We construct the measure for 2,123 stocks in the Refinitiv ESG database where the 13F investor holding data is available.

3.2.2 Empirical Design

To study the effect of ES on corporate financial performance, we run two sets of regressions. Our main set of results uses difference-in-differences regression specifications to better identify the effect of the COVID-19 pandemic. We also use cross-sectional regressions of firms' quarterly stock market performance. The cross-sectional regressions provide less clean estimates of the

[25] An inspection of Table 3.1 reveals that *Investor-based ES* is much higher than firm *ES*. We have reconstructed an equal-weight investor ES measure. That is, in this new measure, we first equal-weight ES scores of firms held by an investor. This first step is different from our current measure that uses value weights. In a second step, we follow our previous procedure by value-weighting these scores into the firm-level measure. The new measure is much closer to firm-level ES. This is because investor portfolios are tilted to larger firms and larger firms tend to have more ES. The results using this new measure are very similar to our value-weighted measure, suggesting that our results on investors' ES preference are not driven by investor weighting of large cap stocks.

effect of the crisis, because of the fiscal response that ensued, but provides some external validity by not being tied to a specific shock date. Also, the cross-sectional regressions are comparable with the operating performance regressions for which we only have quarterly data.

Consider first the cross-sectional regression specification:

$$Performance_i = ß_0 + ß_1 ES_i + ß_2 Firm\ controls_i + ß_3 Industry\ FE_i + \varepsilon_i. \quad (1)$$

We use this specification to study the behaviour of three different dependent variables: quarterly abnormal returns, return volatility (total and idiosyncratic volatility), and operating performance (measured by return on assets, operating profit margin, and asset turnover). The unit of observation is firm *i* during the first quarter of 2020. The independent variable of interest, *ES*, is the environmental and social rating of firm *i* in 2018. We control for several firm characteristics. For stock return and volatility regressions, we control for *Tobin's q*, *Size*, *Cash*, *Leverage*, *Return on equity*, *Advertising*, *Historical volatility*, and *Dividend yield* of firm *i* in 2019, and use ordinary least squares. For operating performance regressions, we control for *Tobin's q*, *Cash*, and *Leverage* of firm *i* in 2019, and use median regressions, following Gompers, Ishii, and Metrick (2003). We run regression specifications with and without industry fixed effects based on the Fama and French 12 industry of firm *i*. Standard errors are robust to heteroscedasticity.

In our main tests of difference-in-differences regressions, we run the following daily regressions:

$$Stock\ performance_{it} = ß_0 + ß_1 ES\_treatment_i \times Post\_COVID_t$$

$$+ ß_2 ES\_treatment_i \times Post\_fiscal_t + ß_3 Firm\ FE_i + ß_4 Day\ FE_t + \varepsilon_{it}. \quad (2)$$

The two dependent variables we study are daily abnormal returns and daily return volatility (measured by daily price range) of firm *i* on day *t* during the first quarter of 2020. *ES_treatment* is a dummy variable that equals one for firm *i* if its ES rating is ranked in the top quartile in 2018, and zero otherwise. *Post_COVID* equals one from February 24 to March 31, 2020, and zero before this period. *Post_fiscal* equals one from March 18 to March 31, 2020, and zero before this period. We control for the second event to have a cleaner identification of the effect of the COVID-19 pandemic. We include firm and day fixed effects to control for any other unobservable effects, and cluster the standard errors by firm and day.

To understand our choice of event window for *Post_COVID* and *Post_fiscal*, consider Figure 3.1. Figure 3.1 depicts S&P 500 performance during the first quarter of 2020, with two dates highlighted: February 24 and March 18, 2020. These dates are used to identify the pandemic shock in our difference-in-differences regressions. February 24 is the start of the "fever" period in Ramelli and Wagner (2020). It is also the first trading day after the first lockdown in Europe, in Northern Italy. We construct a second event dummy to isolate the effect of the U.S. fiscal and monetary policy response to the pandemic on firms' stock returns. March 18 is the day that President Trump signed the second Coronavirus Emergency Aid Package (CEAP) (the Families First Corona Response Act). March 18 is also the date the Federal Reserve begins making purchases under the Commercial Paper Funding Facility to alleviate the strain in short-term credit markets. The first CEAP signed on March 6 into law is a very small package of $8.3 billion targeted to combat the spread of Coronavirus. The third and largest CEAP (the Coronavirus Aid, Relief, and Economic Security Act) is signed by President Trump on March 27.

In Equation (2), the coefficient on the first interaction term ($ß_1$) captures the causal effect of ES policies on stock performance during the crisis, whereas the coefficient on the second interaction term ($ß_2$) reflects the additional effect during the second period when we expect the ES effect on stock returns to be weakened by aggressive fiscal and monetary interventions.

To test the specific mechanisms of how ES policies help build resiliency, we add triple interaction terms to the above difference-in-differences regressions. The triple interaction between *ES Treatment*, *Post_COVID*, and a dummy indicating the firms in the top quartile of advertising expenditures (*Investor-based ES*) captures the effect from the customer (investor) loyalty mechanism. We also include a triple interaction with *Post_fiscal* instead of *Post_COVID*. The regressions include all possible double interactions. We continue to include firm and day fixed effects and cluster standard errors by firm and day. We expect that the main effect we capture arises mostly in firms with high customer and investor loyalty.

Our test uses the COVID-19 pandemic shock to detect causality by studying the effect of precrisis ES on financial performance during the crisis, because we measure ES with a lag of more than a year (when the pandemic was unforeseen) and also because in the narrow window during the COVID-19 crisis firms have very little time to respond. Consequently, we attribute the stock market reaction to the predetermined ES policies.

3.3 Results

3.3.1 Level of Stock Returns

Table 3.2 presents results of regressing quarterly CAPM-adjusted log returns on firms' ES ratings and other firm characteristics. In column 1, we use ES ratings as the only independent variable. In column 2, we add industry fixed effects, and, in column 3, we add firm controls as independent variables. Standard errors are robust to heteroscedasticity. The effect of ES ratings on stock returns is significant at the 5% level or better, even after controlling for all the variables. The magnitude of the coefficient estimate suggests that one standard deviation increase in ES ratings is associated with a higher stock return in the first quarter of 1.8% on average (8.5 x 0.212). The economic magnitude of this coefficient encompasses the response of ES firms' stock returns both to the pandemic and to the fiscal response at the end of the quarter. Firms with high Tobin's q, larger firms, firms with high cash, firms with lower leverage, firms with lower historical volatility, and firms with lower dividends all perform better (for a discussion of the role of cash and leverage, see Ramelli and Wagner [2020]).

To understand the connection between high- and low-rated ES policies and firms' stock returns during the pandemic, consider two pairs of companies: (1) Intel and Broadcom (business equipment industry) and (2) Verizon and Dish Network (telecommunications industry). Intel and Broadcom ES ratings are 87% and 25%, respectively. Broadcom's ES score is penalized by the risks it faces through its partner companies regarding climate change, hazardous materials, and waste. During the first quarter, Intel's raw return is -9.6% and the CAPM-adjusted return is 17.3%. In contrast, Broadcom's raw return is lower at -25% and its CAPM-adjusted return is 0.4%. A similar picture emerges from Verizon and Dish Network. Verizon's ES rating is 63%

with raw returns of 12.5% (-3.6% CAPM-adjusted) during first quarter of 2020, whereas Dish Network's ES rating is lower at 18% with also lower raw returns of -43.6% (-20.8% CAPM-adjusted). Dish Network's ES susceptibility arises from its carbon footprint and pollution management. Of course these firms differ also with respect to size, profitability, and leverage, besides their ES ratings, but for this reason we control for firm characteristics in our cross-sectional regressions.

Next, we conduct a difference-in-differences estimation that captures a tighter link between the performance of firms with high ES ratings and the COVID-19 pandemic by using daily data and two event dummies, *Post_COVID* and *Post_fiscal*. The treatment group of firms is represented by the dummy variable *ES_treatment*. A similar identification strategy is used in Lins, Servaes, and Tamayo (2017), though they do not have the benefit of daily data.

Table 3.3 contains the results. Column 1 omits fixed effects, and column 2 includes firm and day fixed effects. Standard errors are clustered by firm and day. The results show that the coefficient associated with the interaction between *Post_COVID* and *ES_treatment* is positive and significant at the 1% level. High ES-rated firms earn an average abnormal daily return of 0.45% relative to other firms from February 24 to March 17, for a cumulative effect of 7.2% (0.45% x 16). The economic significance is markedly larger than in the cross-sectional regressions of Table 3.2, because we are able to identify the response of stock returns to the pandemic with daily data. The results also show that the fiscal response dummy interacted with the high-ES dummy is insignificant. Overall, investors pay more for firms with higher ES ratings as the market collapses in the first quarter of 2020. We perform a test of the parallel trends assumption to establish that our results are not due to diverging behavior of highly rated ES firms relative to other firms even before the COVID-19 pandemic. The Internet Appendix contains a formal test by regressing daily abnormal returns from January 1, 2020, to February 23, 2020, on a dummy for high ES firms and finds an insignificant coefficient. Thus, the difference-in-differences specification satisfies the parallel trends assumption.

To further document the resiliency of stock returns of high ES-rated firms, we conduct daily cross-sectional regressions of cumulative CAPM-adjusted stock returns (from the start of the quarter to each day) on ES ratings, Tobin's q, firm size, cash to assets, financial leverage, return on equity, advertising expenditures, dividend yield, past return volatility, and industry fixed effects (as in Ramelli and Wagner [2020]). Figure 3.2 plots the daily loading on ES ratings, cash to assets, and leverage with 90% confidence bands constructed using heteroscedasticity-robust standard errors. The advantage of this analysis relative to the difference-in-differences regressions is that we do not commit to a particular event date to see how the relevancy of ES ratings changes over time. The disadvantage is that it does not give an estimate of the average change in stock returns. The figure shows the loading on ES ratings increasing dramatically at the end of February until it plateaus in mid-March. It describes the building up toward the effect we eventually find in the cross-sectional regressions of quarterly returns (note that the last point estimate in Figure 3.2 is the same as the point estimate in column 3 of Table 3.2).[26] Prior to the COVID-19 shock, there is no significant return difference between ES firms and others, consistent with the results from the parallel trends test discussed above. The loading on cash to assets also increases reaching higher levels to that of ES, whereas the loading on leverage is negative and falls precipitously post-February, consistent with Acharya and Steffen (2020) and Ramelli and Wagner (2020). The reasons for the dramatic effect of ES on returns are analyzed in Section 4.

3.3.2 Volatility of Stock Returns

Toward the resiliency hypothesis of ES firms, we also provide evidence of how the volatility of stock returns varies with ES ratings in the cross-section. In Table 3.4, we repeat the regressions in Table 3.2 using the standard deviation of daily raw log returns over the quarter as the dependent variable (columns 1, 2, and 3) and the idiosyncratic volatility calculated as the standard deviation of CAPM-adjusted daily stock returns over the quarter (columns 4, 5, and 6). Standard errors are robust to heteroscedasticity. In all regression specifications, we find that firms with high ES ratings experience a decrease in stock return volatility as compared to other firms (with 1% or better significance level). One standard deviation increase in ES is associated with a decrease in total volatility of 0.29 (-1.374 x 0.212), which represents close to 5% of the mean volatility of stock returns.

[26] During the first quarter of 2020, many high-dividend stocks suspended dividend or share repurchase programs. Based on news headline searches on Factiva, we find that the earliest article with such news is dated March 20 from Dow Jones Newswire. Therefore, this news unlikely affects our results for the first quarter.

Just as with stock returns, we conduct a difference-in-differences analysis to better tie the variation in volatility of stock returns to the COVID-19 pandemic. For this analysis, we use a range-based measure of daily volatility, the daily high price minus the daily low price divided by the average price. We repeat the regressions in Table 3.3 using price-range volatility as the dependent variable.

Table 3.5 presents the results. The regressions show that the change in volatility can be traced to the *Post_COVID* treatment variable. Range-based volatility of stock returns for highly rated ES firms decreases relative to other firms. High ES-rated firms experience an average daily decrease in price-range volatility of 0.63% relative to other firms from February 24 to March 17, for a cumulative effect of 10.1% (-0.63% x 16). Similarly to the evidence from stock returns, the economic magnitude of the ES effect increases when the regressions more clearly isolate the effect of the pandemic on the stock market. Table 3.5 also suggests that the fiscal policy treatment dummy has an added effect contributing to even lower volatility of high ES-rated firm returns relative to other firms.[27]

Overall, the resiliency of high-rated ES stock returns is displayed both in the performance of mean returns and in the volatility of returns.

3.3.3 Operating Performance

Stock returns are forward-looking and incorporate information quickly and our tests above make use of that feature of capital markets. Accounting numbers are slower at incorporating information, especially as the effects from the pandemic keep unfolding. Here, we conduct a somewhat preliminary look at accounting performance metrics as they respond to the COVID-19 pandemic.

[27] We also analyze whether our results on stock returns and volatility can be explained by a lack of trading for ES stocks. We repeat the difference-in-differences regression specifications of Table 3.3, but with daily stock trading volume as the dependent variable. The results, reported in the Internet Appendix, show that daily trading volume significantly increases for highly ES-rated firms relative to other firms after the February 24 event date, suggesting that investors stepped in to stop the downward slide in prices. Hence, our stock return and volatility results cannot be explained by thin trading.

We measure the change in operating performance from the fourth quarter of 2019 to the first quarter of 2020 using three different metrics. *ROA* is the return on assets, calculated as operating income before depreciation divided by book value of assets. *OPM* is the operating profit margin, calculated as operating income before depreciation divided by sales. *AT* is the asset turnover, calculated as sales divided by book value of assets. Following Gompers, Ishii, and Metrick (2003), we estimate median regressions using the least absolute deviation method to reduce the impact of large outliers in the accounting metrics. We include Tobin's q to control for value and growth firms. In an alternative specification, we also include cash and leverage as controls. We include industry fixed effects in all regressions. Standard errors are robust to heteroscedasticity and misspecification.

Table 3.6 presents the results. In columns 3 and 4, we find that firms with high ES ratings have higher operating profit margins, consistent with predictions from Albuquerque, Koskinen, and Zhang (2019). One standard deviation increase in ES increases the change in *OPM* by 0.46 (2.181 x 0.212), or 6% of the sample mean change. In columns 5 and 6, we find that asset turnover is lower for firms with high ES ratings relative to other firms during the first quarter. High ES firms appear to increase profit margins even as sales decline. It is possible that these firms either increased prices or maintained their high-profit margins despite the decrease in demand for their products, taking advantage of their customer loyalty consistent with work by Luo and Bhattacharya (2009), Servaes and Tamayo (2013), and Albuquerque, Koskinen, and Zhang (2019). We do not find that ES policies affect the return on assets during the first quarter of 2020. This is not surprising since *ROA* is the product of *OPM* and *AT*.

3.4 Two Mechanisms of Resiliency

We study two mechanisms that can potentially explain the resiliency of firms with high ES ratings: customer loyalty and investor segmentation. Both mechanisms predict lower systematic risk associated with high ES stocks. Luo and Bhattacharya (2009) and Albuquerque, Koskinen, and Zhang (2019) propose that customers are more loyal to firms with a strong reputation and that credibly pursue ES policies. In Albuquerque, Koskinen, and Zhang (2019), these firms benefit from lower price elasticity of demand to obtain higher profit margins. These higher profit margins lower operating leverage and reduce firms' systematic risk. Intuitively, customer resiliency delivers stock price resiliency. Albuquerque, Koskinen, and Zhang (2019) present direct evidence of this mechanism by showing that changes in *ROA* are less positively correlated with the business cycle for high ES firms. The evidence in Table 3.6 that the operating profit margin increases for high ES firms relative to other firms is also consistent with this mechanism. We follow Albuquerque, Koskinen, and Zhang (2019) and others in using advertising expenditures to measure customer loyalty. We expect that the stock return effect we find is more pronounced for firms with high advertising expenditures.

The second mechanism adapts the segmented capital markets model of Heinkel, Kraus, and Zechner (2001), where polluting firms are only held by a subset of investors, since ES investors choose not to hold them. The higher systematic risk of polluting firms is linked to their owners' lack of diversification. Similarly to customer loyalty, investor loyalty can contribute to the resiliency of ES stocks. The literature on Sustainable and Responsible Investments (SRI) shows that investors are more loyal, and less sensitive to SRI funds' performance than to conventional mutual funds' performance (Bollen 2007; Renneboog, Ter Horst, and Zhang 2011). Our proxy for ES investor preferences is constructed using the idea of revealed preference detailed in Section 2.[28] We expect that stocks with investors with a preference for ES have less systematic risk and total risk.

Table 3.7 displays the results for stock returns. In our tests, we expand the difference-in-differences regressions in Table 3.3 to a triple interaction between *Post_COVID*, *ES_treatment*, and a dummy indicating the firms in the top quartile of advertising expenditures (in columns 1 and 2), and to a triple interaction between *Post_COVID*, *ES_treatment*, and a dummy indicating the firms in the top quartile of ES investor preference (in columns 3 and 4). In columns 1 and 2, we find positive estimates of the triple interaction linked to advertising expenditures. Column 2 adds firm and day fixed effects to the regression. In both columns, standard errors are clustered by firm and day. Consistent with the predictions from the first mechanism, there is a significant average abnormal return earned by firms with high ES ratings and high advertising expenditures

[28] We also use an alternative investor preference measure of ES, which is the institutional ownership of a firm by pension funds and endowments. Starks, Venkat, and Zhu (2018) show the long-term investors prefer high ES stocks. We do not find that this measure has any effects.

relative to firms with low ES ratings or low advertising expenditures after February 24. The effect is 0.53% in daily returns, which is 76% larger than the effect for low advertising but high ES firms (0.533/0.302 = 1.76). Columns 3 to 4 show positive estimates on the triple interaction of interest linked to ES investor preference.[29] However, the estimates are not statistically significant. Economically, the point estimate on the ES investor preference triple interaction is half of the effect estimated in the triple interaction with advertising expenditures.

Taken together, our return analysis shows strong support for the customer loyalty mechanism for resiliency, which is also consistent with the results regarding operating profit margins. We note that the two mechanisms discussed explain why high ES firms have lower market beta, but they do not fully explain the resiliency of ES firms. The reason is that the dependent variable in the tests above is the CAPM-adjusted stock return, which already accounts for differences in firm beta. Therefore, our results suggest that ES firms appear more resilient during the COVID-19 crisis than what investors expected before the crisis (as reflected by the precrisis firm beta). Still, it is also possible that the better performance of CAPM-adjusted returns is due to a decline in betas during the first quarter for high ES firms. Declining betas of ES stocks may be due to expectations that firm cash flows become less risky than low-ES stocks after the crisis, generating the increased loading on ES as shown in Figure 3.2.

Table 3.8 reports the results of tests of the two mechanisms of resiliency for stock return volatility. We repeat the difference-in-differences regressions of Table 3.5 that uses the daily price range as a proxy for volatility. In columns 1 and 2, we find negative estimates of the triple interaction linked to advertising expenditures, but they are not statistically significant. In columns 3 and 4, we find significantly negative estimates on the triple interaction of interest linked to ES investor preference. Consistent with the predictions from the investor preference mechanism, there is a significant lower range-based volatility by firms with high ES ratings and high ES investor preference relative to other firms after February 24. In fact, the reduction in volatility for high ES firms appears to be concentrated in firms with high ES investor preference.

[29] Cella, Ellul, and Giannetti (2013) show that, during market turmoil, such as the COVID-19 stock market crash, institutional investors with longer trading horizons sell their shares to a lesser extent than investors with short-term trading strategies. To the extent that ES investors have long-term trading horizons, we would expect ES stocks to have smaller price declines.

Overall, our results show a strong effect of customer loyalty on stock returns and of investor ES preference on the volatility of stock returns. These results are consistent with the evidence in Gantchev, Giannetti, and Li (2019), who show that both customers and investors can provide market discipline when firms' ES policies are lacking. This paper shows that influencing the behaviors of both consumers and investors is important for firm resiliency.

3.5 Robustness

We investigate two alternative explanations for our findings. One alternative explanation is that the oil price decline in the first quarter of 2020 affected particularly firms in the energy sector, which are known to score low in some dimensions of ES. Energy sector firms would then have significantly lower returns and higher volatility relative to other firms. The Internet Appendix shows that the results are even stronger after excluding firms in the energy sector from our sample.

Another alternative explanation for our results is that some businesses, such as utilities, telecommunication, and financial industries, were considered "essential" and kept on operating in a normal fashion. This may have resulted in some resiliency of cash flows and stock returns for these businesses. To examine this explanation, we investigate the effect of ES ratings on stock returns by industry. We use the Fama-French classification for 12 industries. We repeat the regression specification in Table 3.3, allowing for triple interactions of *Post_COVID* with the *ES_treatment* and a dummy for each of the industries. Figure 3.3 shows the results. The figure shows that all but one industry display positive point estimates on the interaction between *Post_COVID* and the *ES_treatment*. Five of those estimates are statistically significant. The one negative point estimates is statistically insignificant. Overall, the figure suggests that our findings are not associated with any particular industry, but encompass most industries. We go one step further to rule out this alternative explanation. It is possible that the *ES_treatment* is not randomly distributed across industries. We then construct an *ES_treatment* within each industry. This way we are exploiting cross-sectional variation in ES within each industry. The results are very similar to those displayed in Figure 3.3.

We conduct several additional robustness tests. First, we augment the list of firm-level variables in the cross-sectional regressions of quarterly stock returns and quarterly volatility of stock returns with operating leverage and measures of institutional ownership. Operating leverage, calculated as in Albuquerque, Koskinen, and Zhang (2019) and others, leads to a significant drop in the number of observations. Still, our results hold and are quantitatively similar.

Second, we redo the analysis with MSCI's ESG Research database, previously known as KLD. MSCI rates firms on a variety of strengths and concerns on seven attributes: community, diversity, employee relations, environment, product, human rights, and governance. We exclude corporate governance attributes from our analysis to focus on nongovernance aspects of ESG. We measure ES as the difference between the number of strengths and the number of concerns for each firm in 2016, the last year for which data is available. Given that the number of individual concerns and strengths in each attribute varies over time and across firms, we divide the number of strengths (concerns) for each firm-year across all six ES categories by the maximum possible number of strengths (concerns) in all six categories for each firm. We then subtract the scaled concerns from the scaled strengths to obtain our alternative measure, which is bounded between -1 and 1. We find very similar results with the proxy for ES constructed with MSCI ES data as in Albuquerque, Koskinen, and Zhang (2019). While the MSCI ratings are from 2016 (the latest observation available), firm ES ratings are fairly sticky, which may explain the results. Another possible explanation for the similarity in results despite the lag in the measurement of the ES proxy is that investors care about firm reputation and credibility for ES policies and such reputation depends on a multiyear track record of ES performance. See the Internet Appendix for results with alternative ES ratings.

Third, we change the *Post_COVID* to equal one from January 30 onward. January 30 is the day the World Health Organization declares the outbreak a public health emergency. The results corresponding to Table 3.3 and Tables 3.5, 3.7, and 3.8 are somewhat weaker because the coefficients of interest are smaller, but retain significance at 10% level or higher.

Finally, we consider the separate roles of E and S in ES. Using Refinitiv's scores, we show that the results in the paper are very similar if we use only the E or the S scores. This is perhaps to be expected because the correlation between the two scores is 0.73, and the correlation between the aggregate score ES and either E or S is over 0.91 (untabulated results). Firms appear to invest in both E and S simulataneously, a reality that limits our ability to evaluate their separate contributions.[30] The last component in ESG, the governance score, has only a correlation of 0.52 with the E score and 0.43 with the S score (untabulated). When we rerun our analysis with the G score, we find that the G score explains the cross-section of stock returns, but only if other firm characteristics are not included in the regression. Thus, the results with the G score serve to reassure that our main results are not picking up a good corporate governance effect.

3.6 Conclusion

The first quarter of 2020 was an extraordinary time for U.S. stock markets: first a calm period before the storm, then the fastest collapse ever, followed with a vigorous rally, all related to the unfolding of an unexpected, exogenous, health pandemic. We use this episode to study how ES firm policies conditioned the stock market response of firms. Specifically, we are interested in testing how customer and investor loyalty based theories of ES account for the stock price properties during the first quarter of 2020. We show that stock prices for firms with high ES scores perform much better than the prices for other firms. The stock market performance is especially strong during the market collapse for high ES stocks with high advertising. Operating profit margin of firms with high ES scores increase in the first quarter of 2020 even as sales decline consistent with a customer loyalty mechanism. In addition, the volatility of stock returns is lower for high ES stocks. Firms held by investors with a preference for ES display larger reductions in the volatility of stock returns. The evidence presented in this paper is consistent with the view that increasing the loyalty of both consumers and investors is an important antecedent for the resiliency of ES firms.

Systematic unobservable differences between high and low ES firms unlikely explain our results, since we control for time-invariant unobservable firm effects in our difference-in-differences regressions. However, ES policies could be possibly correlated with time-varying factors that affect firm value. For example, the COVID-19 pandemic, which threatens firms' survival, could

[30] We also investigate a potential employee channel within S using Refinitiv's Workplace score. The results are similar to the main results in the paper (except that they are weak in the cross-sectional return regressions), which is perhaps not surprising given the high correlation between Workplace score and ES score of 0.78.

have led to increased investor beliefs that consumer demand for quality products will increase in the long run. As a result, there may be other mechanisms, apart from customer and investor loyalty to ES policies, that also render the high-ES firms less susceptible to the COVID-19 shock. We leave the examination of these additional questions for later study.

Table 3.1 Summary Statistics

This table reports the summary statistics (number of observations, mean, standard deviation [SD], and 25th, 50th [median], and 75th percentiles) for all variables. The appendix defines all variables used in the paper.

Variable	Obs.	Mean	SD	25%	Median	75%
Quarterly abnormal return	2,171	-22.971	42.482	-39.841	-17.397	2.803
ES	2,171	0.289	0.212	0.136	0.208	0.384
Investor-based ES	2,123	0.544	0.064	0.514	0.555	0.587
Tobin's q	1,971	2.268	1.882	1.098	1.545	2.600
Size	1,973	7.138	1.919	6.062	7.180	8.329
Cash	1,972	0.156	0.209	0.023	0.067	0.191
Leverage	1,959	0.321	0.231	0.118	0.307	0.463
ROE	1,971	-0.022	0.691	-0.002	0.092	0.158
Advertising	2,171	0.007	0.020	0.000	0.000	0.002
Historical volatility	2,171	2.328	1.274	1.451	1.962	2.793
Dividend	1,973	1.735	2.365	0.000	0.905	2.628
Volatility	2,171	6.128	2.954	4.446	5.452	7.037
Idio. volatility	2,171	4.761	3.049	2.973	4.006	5.746
ΔROA_qtr	1,536	-0.661	2.336	-1.024	-0.276	0.186
ΔOPM_qtr	1,515	-7.989	66.460	-8.022	-1.632	1.269
ΔAT_qtr	1,755	-1.236	3.255	-2.007	-0.258	0.091
Daily abnormal return	134,689	-0.370	5.650	-1.633	-0.141	1.159
Daily price range	134,689	5.978	6.625	1.933	3.774	7.726

Table 3.2 Cross-sectional Regressions for Quarterly Abnormal Returns

This table reports the results of regressions of the first quarter 2020 abnormal returns on firms' ES under several specifications: without firm controls (specification 1), with industry fixed effects (specification 2), and with industry fixed effects and firm controls (specification 3). Control variables are winsorized at the 1% level in each tail. Standard errors are heteroscedasticity robust. The regression constant is not reported for brevity. The numbers in parentheses are *t*-statistics. The appendix defines all variables used in the paper. **p* < .1; ***p* < .05; ****p* < .01.

	(1)	(2)	(3)
Dependent variable	Abnormal return	Abnormal return	Abnormal return
ES	16.568***	19.500***	8.542**
	(4.30)	(5.56)	(2.05)
Tobin's q			3.857***
			(8.25)
Size			3.179***
			(4.85)
Cash			27.209***
			(4.86)
Leverage			-29.584***
			(-7.05)
ROE			0.730
			(0.49)
Advertising			-9.797
			(-0.24)
Historical volatility			-4.427***
			(-3.62)
Dividend			-2.378***
			(-4.93)
Industry FE	No	Yes	Yes
Number of firms	2,171	2,171	1,958
Adj. R^2	.006	.229	.352

Table 3.3 Difference-in-differences Regressions for Daily Abnormal Returns

This table reports the results of a difference-in-differences estimation of daily abnormal returns during the first quarter of 2020. *ES_treatment* equals one for high ES firms, and zero otherwise. *Post_COVID* equals one from February 24 to March 31, 2020, and zero before this period. *Post_fiscal* equals one from March 18 to March 31, 2020, and zero before this period. Firm and day fixed effects are (not) included in Specification 2 (1). Standard errors are clustered by firm and day. The regression constant is not reported for brevity. The numbers in parentheses are *t*-statistics. The appendix defines all variables used in the paper. *$p < .1$; **$p < .05$; ***$p < .01$.

Dependent variable	(1) Abnormal return	(2) Abnormal return
*ES_treatment*Post_COVID*	0.453***	0.453***
	(3.06)	(3.03)
*ES_treatment*Post_fiscal*	-0.568	-0.567
	(-0.94)	(-0.94)
ES_treatment	-0.000	
	(-0.00)	
Post_COVID	-1.095***	
	(-3.66)	
Post_fiscal	1.280	
	(0.99)	
Firm FE	No	Yes
Day FE	No	Yes
Number of firm-days	134,689	134,689
Adj. R^2	.007	.082

Table 3.4 Cross-sectional Regressions for Volatility

This table reports results for cross-sectional regressions of *Volatility* and *Idio*. *Volatility* during the first quarter of 2020 on firms' ES under several specifications: without firm controls (specifications 1 and 4), with industry fixed effects (specifications 2 and 5), and with industry fixed effects and firm controls (specifications 3 and 6). Control variables are winsorized at the 1% level in each tail. Standard errors are heteroscedasticity robust. The regression constant is not reported for brevity. The numbers in parentheses are *t*-statistics. The appendix defines all variables used in the paper. **p* < .1; ***p* < .05; ****p* < .01.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Volatility	Volatility	Volatility	Idio. Volatility	Idio. volatility	Idio. volatility
ES	-2.409***	-2.315***	-1.374***	-2.830***	-2.740***	-1.568***
	(-9.54)	(-9.66)	(-5.10)	(-11.06)	(-11.31)	(-5.79)
Tobin's q			-0.158***			-0.165***
			(-6.22)			(-6.58)
Size			-0.105**			-0.157***
			(-2.14)			(-3.15)
Cash			-0.821**			-0.622*
			(-2.46)			(-1.95)
Leverage			2.648***			2.856***
			(9.49)			(10.08)
ROE			-0.017			-0.083
			(-0.22)			(-1.09)
Advertising			-1.814			1.434
			(-0.94)			(0.82)
Historical volatility			0.747***			0.786***
			(11.36)			(12.24)
Dividend			0.058			0.094**
			(1.55)			(2.39)
Industry FE	No	Yes	Yes	No	Yes	Yes
Number of firms	2,171	2,171	1,958	2,171	2,171	1,958
Adj. R^2	.030	.140	.282	.038	.143	.301

Table 3.5 Difference-in-differences Regressions for the Daily Price Range

This table reports the results of difference-in-differences estimation for the daily price range during the first quarter of 2020. *ES_treatment* equals one for high ES firms, and zero otherwise. *Post_COVID* equals one from February 24 to March 31, 2020, and zero before this period. *Post_fiscal* equals one from March 18 to March 31, 2020, and zero before this period. Firm and day fixed effects are (not) included in Specification 2 (1). Standard errors are clustered by firm and day. The regression constant is not reported for brevity. The numbers in parentheses are *t*-statistics. The appendix defines all variables used in the paper. *$p < .1$; **$p < .05$; ***$p < .01$.

	(1)	(2)
Dependent variable	Daily price range	Daily price range
*ES_treatment**Post_COVID*	-0.628***	-0.630***
	(-3.61)	(-3.45)
*ES_treatment**Post_fiscal*	-0.613*	-0.614*
	(-1.95)	(-1.88)
ES_treatment	-0.958***	
	(-11.30)	
Post_COVID	5.507***	
	(5.86)	
Post_fiscal	4.505***	
	(2.79)	
Firm FE	No	Yes
Day FE	No	Yes
Number of firm-days	134,689	134,689
Adj. R^2	.324	.622

Table 3.6 Cross-sectional Regressions for Operating Performance

This table reports the results of regressions of the operating performance's quarterly change (the first quarter of 2020 minus the fourth quarter of 2019) on firms' ES. The dependent variables are the quarterly changes of return on assets (specifications 1 and 2), operating profit margin (specifications 3 and 4), and asset turnover (specifications 5 and 6). All variables are winsorized at the 1% level in each tail. Results in this table are based on LAD (least absolute deviation) regressions. All specifications include industry fixed effects. Standard errors are robust to heteroscedasticity and misspecification. The regression constant is not reported for brevity. The numbers in parentheses are *t*-statistics. The appendix defines all variables used in the paper. *$p < .1$; **$p < .05$; ***$p < .01$.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	*ΔROA_qtr*	*ΔROA_qtr*	*ΔOPM_qtr*	*ΔOPM_qtr*	*ΔAT_qtr*	*ΔAT_qtr*
ES	-0.046	-0.020	2.210***	2.181***	-0.297**	-0.298*
	(-0.45)	(-0.19)	(3.12)	(2.92)	(-2.01)	(-1.91)
Tobin's q	-0.052**	-0.045	0.127	0.167	0.004	-0.008
	(-2.20)	(-1.52)	(1.08)	(1.14)	(0.14)	(-0.27)
Cash		-0.206		-0.565		0.477**
		(-0.73)		(-0.19)		(1.97)
Leverage		-0.232*		0.936		-0.064
		(-1.66)		(0.81)		(-0.45)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	1,536	1,529	1,515	1,508	1,755	1,744
R^2	.043	.045	.008	.008	.068	.069

Table 3.7 Triple Interactions Regressions for Daily Abnormal Returns

This table reports the results of triple interactions estimation for daily abnormal returns during the first quarter of 2020 using difference-in-difference-in-differences regressions. *ES_treatment* equals one for high ES firms, and zero otherwise. *Post_COVID* equals one from February 24 to March 31, 2020, and zero before this period. *Post_fiscal* equals one from March 18 to March 31, 2020, and zero before this period. Specifications 1 and 2 (3 and 4) are triple interaction regressions for high advertising (Investor-based ES) firms. Firm and day fixed effects are (not) included in Specifications 2 and 4 (1 and 3). Standard errors are clustered by firm and day. The regression constant is not reported for brevity. The numbers in parentheses are *t*-statistics. The appendix defines all variables used in the paper. *$p < .1$; **$p < .05$; ***$p < .01$.

Dependent variable	(1) Abnormal return	(2) Abnormal return	(3) Abnormal return	(4) Abnormal return
*ES_treatment*Post_COVID*Advertising_high*	0.532**	0.533**		
	(2.35)	(2.33)		
*ES_treatment*Post_fiscal*Advertising_high*	-1.018**	-1.019**		
	(-2.47)	(-2.45)		
*ES_treatment*Post_COVID*InvestorES_high*			0.272	0.271
			(1.08)	(1.06)
*ES_treatment*Post_fiscal*InvestorES_high*			0.125	0.127
			(0.28)	(0.28)
*ES_treatment*Post_COVID*	0.302**	0.302**	0.283*	0.284*
	(2.07)	(2.05)	(1.77)	(1.74)
*ES_treatment*Post_fiscal*	-0.292	-0.292	-0.417	-0.418
	(-0.51)	(-0.51)	(-1.08)	(-1.06)
All dummies and other possible interactions included	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes
Day FE	No	Yes	No	Yes
Number of firm-days	134,689	134,689	131,654	131,654
Adj. R^2	.007	.082	.007	.084

Table 3.8 Triple Interactions Regressions for Daily Price Range

This table reports the results of triple interactions estimation for daily price range during the first quarter of 2020 using difference-in-difference-in-differences regressions. *ES_treatment* equals one for high ES firms, and zero otherwise. *Post_COVID* equals one from February 24 to March 31, 2020, and zero before this period. *Post_fiscal* equals one from March 18 to March 31, 2020, and zero before this period. Specifications 1 and 2 (3 and 4) are triple interaction regressions for high Advertising (Investor-based ES) firms. Firm and day fixed effects are (not) included in Specifications 2 and 4 (1 and 3). Standard errors are clustered by firm and day. The regression constant is not reported for brevity. The numbers in parentheses are *t*-statistics. The appendix defines all variables used in the paper. *$p < .1$; **$p < .05$; ***$p < .01$.

	(1)	(2)	(3)	(4)
Dependent variable	Daily price range	Daily price range	Daily price range	Daily price range
*ES_treatment*Post_COVID *Advertising_high*	-0.022	-0.025		
	(-0.11)	(-0.11)		
*ES_treatment*Post_fiscal*Advertising_high*	-0.444*	-0.436		
	(-1.71)	(-1.34)		
*ES_treatment*Post_COVID *InvestorES_high*			-0.879***	-0.875**
			(-2.70)	(-2.49)
*ES_treatment*Post_fiscal* InvestorES_high*			-1.105**	-1.101**
			(-2.59)	(-2.27)
*ES_treatment*Post_COVID*	-0.591***	-0.593***	-0.007	-0.011
	(-3.32)	(-3.11)	(-0.05)	(-0.06)
*ES_treatment*Post_fiscal*	-0.458	-0.462	-0.242	-0.244
	(-1.43)	(-1.36)	(-1.01)	(-0.87)
All dummies and other possible interactions included	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes
Day FE	No	Yes	No	Yes
Number of firm-days	134,689	134,689	131,654	131,654
Adj. R^2	.324	.622	.330	.625

Figure 3.1 S&P 500 during the First Quarter of 2020

This figure plots the stock market path of S&P 500 during the first quarter of 2020. The red lines represent our two event dates.

Figure 3.2 Evolution of Coefficients from Cross-sectional Regressions

This figure plots the evolution of coefficients during the first quarter of 2020 from daily cross-sectional regressions of cumulative stock returns (from the start of the quarter to the day) on ES ratings, Tobin's q, firm size, cash to assets, financial leverage, return on equity, advertising expenditures, dividend yield, historical volatility (all lagged 2019 values), and industry fixed effects. It plots the daily loading on ES ratings, cash to assets, and leverage with 90% confidence intervals based on heteroscedasticity-robust standard errors.

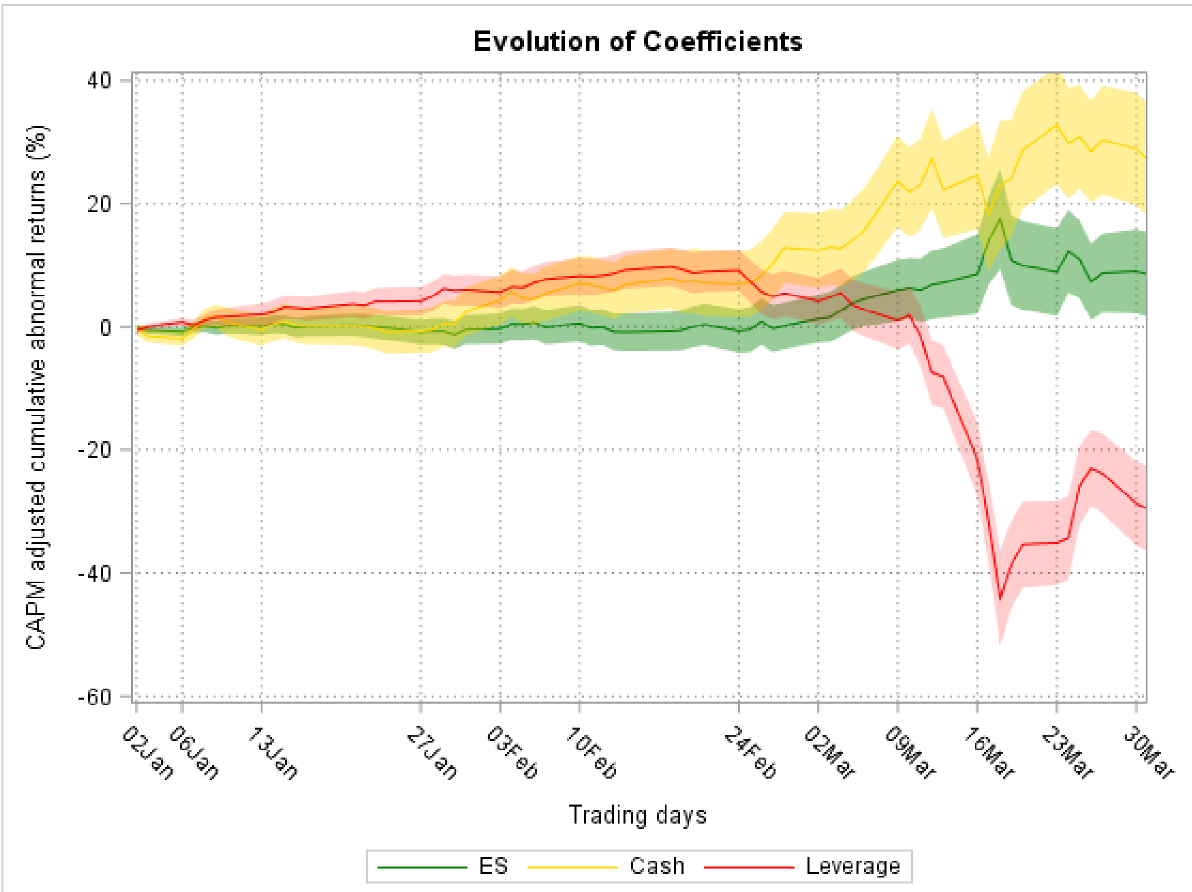
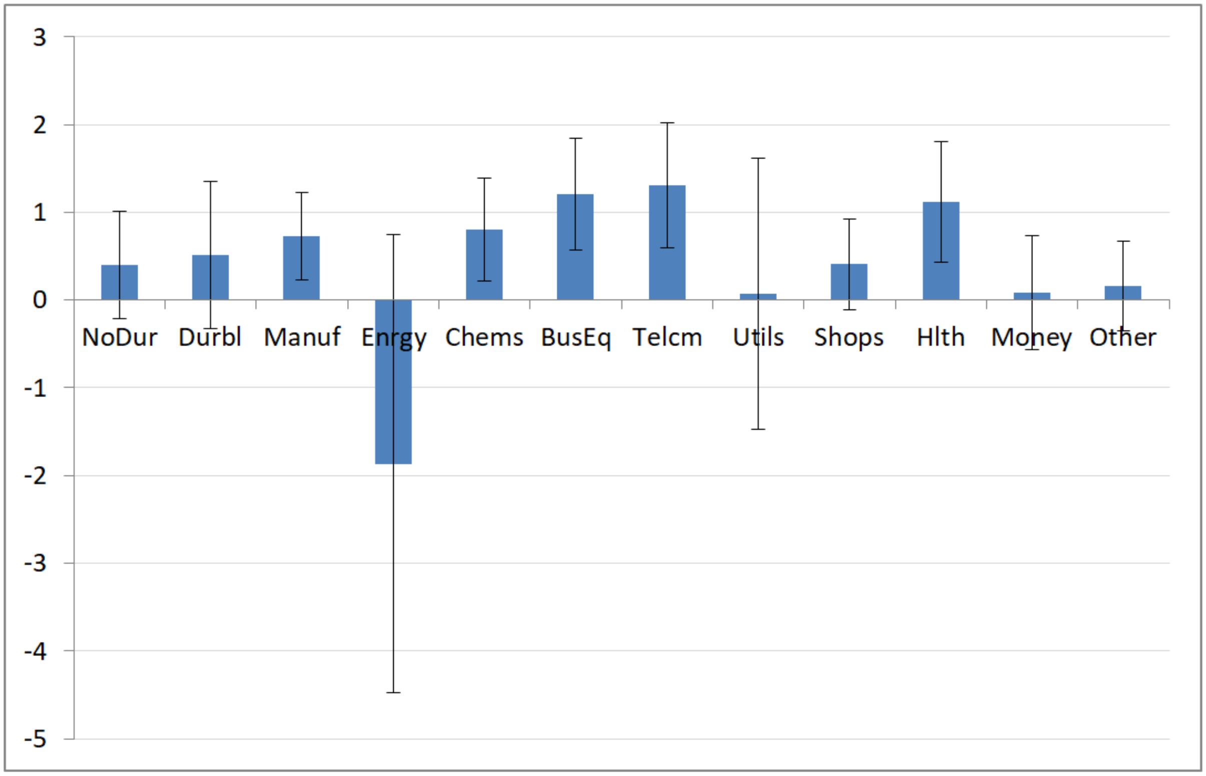


Figure 3.3 ES Coefficients by Industry from Triple Difference Regressions

Regression specification (2) in Table 3.3 is extended to allow for triple interactions of *Post_COVID* with *ES_treatment* and a dummy for each of the Fama and French 12 industries. The figure plots the point estimates of the triple interaction terms with 90% confidence intervals based on heteroscedasticity-robust standard errors.



Appendix 3.1 Variable Definitions

Variable	Definition	Source
ES	Average between Refinitiv Environment Pillar Score and Social Pillar Score, divided by 100 and measured in 2018. Environment (Social) Pillar Score is the weighted average relative rating of a company based on the reported environmental (social) information and the resultant three (four) environmental (social) category scores. *ES_treatment* is an indicator for firms in the top quartile	Thomson Reuter's Refinitiv ESG
Investor-based ES	We first measure an investor's revealed ES preference as the value-weighted average *ES* score of its portfolio holdings for each quarter in 2018, and then average across the four quarters. A firm's *Investor-based ES* is the weighted average of its investors' ES based on first quarter 2019 holdings. *InvestorES_high* is an indicator for firms in the top quartile	Our own calculations based on Thomson Reuter's 13F and Refinitiv ESG
Post_COVID	Dummy variable that equals one from February 24 to March 31, 2020, and zero from January 1 to February 23, 2020	
Post_fiscal	Dummy variable that equals one from March 18 to March 31, 2020, and zero from January 1 to 17 to March 17, 2020	
Tobin's q	Book value of assets (AT) minus the book value of equity (CEQ) plus the market value of equity (CSHO*PRCC), all divided by book value of assets (AT), measured in $US(2019)	Compustat Annual
Size	Natural log of firms' sales (SALE) plus one, measured in $US(2019)	Compustat Annual
Cash	Cash holdings (CHE) over book assets (AT), measured in $US(2019)	Compustat Annual
Leverage	Book value of debt (DLTT+DLC) over book assets (AT), measured in $US(2019)	Compustat Annual
ROE	Net income (NI) over book equity (CEQ), measured in $US(2019)	Compustat Annual
Advertising	Advertising expenditures (XAD) over book assets (AT). Missing values are set to zero, following past literature, measured in $US(2019). *Advertising_high* is an indicator for firms in the top quartile	Compustat Annual
Historical volatility	Volatility of daily logarithm return (i.e., the logarithm of gross return) of a stock during 2019	CRSP
Dividend	Dividend per share (DVPSX) over stock price (PRCC), multiplied by 100, measured in $US(2019)	Compustat Annual
Abnormal return	The daily *Abnormal return* is the difference between daily logarithm return (i.e., the logarithm of gross return) of a stock and the CAPM beta times the daily logarithm return of the market, expressed as a percentage. The CAPM beta is estimated by using daily returns from 2017 and 2019, where the market index is S&P 500. The quarterly *Abnormal return* is measured over the whole period of the first quarter of 2020, i.e. the difference between the logarithm of the stock's gross quarterly return and the CAPM beta times the logarithm of the market's gross quarterly return	CRSP, Capital IQ North America Daily

Volatility	Volatility of daily logarithm returns of a stock during the first quarter of 2020	Capital IQ North America Daily
Idio. volatility	Volatility of daily *Abnormal return* of a stock during the first quarter of 2020	Capital IQ North America Daily
Daily price range	Daily high-low price range of a stock during the first quarter of 2020, scaled by the midpoint of high and low daily prices. The high price (PRCHD) is the highest trade price for the date. Likewise, the low price (PRCLD) is the lowest trade price for the date	Capital IQ North America Daily
Δ ROA_qtr	Quarterly change (the first quarter 2020 value minus the fourth quarter 2019 value) in return on assets. Return on assets is operating income before depreciation (OIBDPQ) over book assets (ATQ), multiplied by 100	Compustat Quarterly
Δ OPM_qtr	Quarterly change (the first quarter 2020 value minus the fourth quarter 2019 value) in the operating profit margin. Operating profit margin is operating income before depreciation (OIBDPQ) over sales (SALEQ), multiplied by 100	Compustat Quarterly
Δ AT_qtr	Quarterly change (the first quarter 2020 value minus the fourth quarter 2019 value) in asset turnover. Asset turnover is sales (SALEQ) over book assets (ATQ), multiplied by 100	Compustat Quarterly

Chapter 4 Conclusion

This thesis studies whether firms' long-term orientation and sustainable corporate governance have positive effects on firm value by exploiting two different experiments.

In Chapter 2, we exploit a quasi-natural experiment based on the staggered adoption of constituency statutes in 35 U.S states. Specifically, we focus on one overlooked common provision of the statutes, which is to explicitly permit directors to consider the long-term interests of the firm. We measure a firm's long-term orientation from different perspectives, and show that constituency statutes indeed encourage firms to manage for the long-term, especially for firms in the technology and pharmaceutical industries. In particular, we find that executives have a longer-term oriented compensation structure, the shareholder composition changes towards greater long-term institutional ownership, firms conduct less earnings management and spend more on R&D after the enactment of constituency statutes, and these effects are mainly concentrated among firms in the technology and pharmaceutical industries, where a longer-term orientation matters the most.

We further show that among firms in the technology and pharmaceutical industries, the shift to a longer-term orientation leads to greater firm value, but this comes at the cost of decreasing cash flows. Overall, this chapter shows that constituency statutes can mitigate short-term opportunism and lengthen the firm horizon, which ultimately creates value for firms. However, this effect is mainly concentrated among firms in the technology and pharmaceutical industries, but not other firms.

In Chapter 3, we exploit the market crash in the first quarter of 2020 induced by COVID-19. The exogenous nature of this crisis presents a unique setting to study the causal relationship between environmental and social (ES) policies and financial performance. Our results show that firms with high ES ratings had better performance in terms of both stock returns and return volatility during period of market crash in the first quarter of 2020. Operating profit margin of firms with high ES ratings also increase in the first quarter of 2020 even as sales decline.

We then study how ES policies contribute to the resiliency of stocks by testing two theories of customer and investor loyalty. We find that firms with high ES ratings and also with stronger customer loyalty exhibit higher abnormal returns during the market collapse, relative to firms with high ES ratings but with weaker customer loyalty. Firms with high ES ratings held by investors with ES preference also display larger reductions in the volatility of stock returns. Our results are consistent with the two theories that customer and investor loyalty contributes to the resiliency of stocks. This resiliency help firms weather unexpected times.

Collectively, this thesis examines how firms' long-term orientation and environmental and social initiatives can influence firms' financial performance. Overall, the thesis provides support for the notion that lengthening and widening firms' decision horizons bring greater firm value.

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Appendix: Co-author and Copyright Permission Letters

Permission to include papers in doctoral thesis

Yrjo Koskinen [redacted]
Wed 17-Mar-2021 11:56
To: Shuai (Kevin) Yang [redacted]

Dear Shuai Yang,

With this email, I formally grant you permission to include the content from our co-authored papers "Is Lengthening the Decision Horizon Good for Firms?" and "Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash" in your doctoral thesis.

Best regards,

Yrjo Koskinen
[redacted]

Permission to include paper in doctoral thesis

Ari Pandes [redacted]
Wed 17-Mar-2021 15:00
To: Shuai (Kevin) Yang [redacted]

Dear Shuai Yang,

With this email, I formally grant you permission to include the content from our co-authored paper "Is Lengthening the Decision Horizon Good for Firms?" in your doctoral thesis.

Best regards,

J. Ari Pandes

–
[redacted]

Permission to include paper in doctoral thesis

Rui Albuquerque [redacted]

Mon 15-Mar-2021 09:48

To: Shuai (Kevin) Yang [redacted]

[redacted]

Dear Shuai Yang,
With this email, I formally grant you permission to include the content from our co-authored paper "Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash" in your doctoral thesis.
Best regards,
Rui

Rui Albuquerque

[redacted]

Permission to include paper in doctoral thesis

Zhang, Chendi [redacted]

Mon 15-Mar-2021 12:00

To: Shuai (Kevin) Yang [redacted]

[redacted]

Dear Shuai Yang,

With this email, I formally grant you permission to include the content from our co-authored paper "Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash" in your doctoral thesis.

Best regards,

Chendi

Professor Chendi Zhang

[redacted]

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