

Watching the Wolves: Unveiling the Moderating Role of Corporate Governance on CEO Power

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Abstract

We use the concurrent passage of the Sarbanes-Oxley Act (SOX) of 2002 and NYSE/NASDAQ listing regulation changes as an exogenous shock to internal firm governance for exploring the impact of powerful CEOs on corporate policies. In particular, we use the heterogeneity in firms' pre-SOX governance, to challenge the notion that CEO power negatively impacts corporate outcomes for all firms. We analyse the impact of CEO power on corporate policy choices including innovation, capital expenditures, property, plant and equipment and total asset growth, M&A deals, leverage, and dividends. We show that for firms that had weaker pre-SOX corporate governance, the improvement in governance induced by exogenous regulatory changes can initiate strategic shift in capital allocation and thus channel or divert the misaligned efforts of powerful CEOs to value-enhancing projects.

Keywords: Powerful CEOs, Sarbanes-Oxley Act (SOX), R&D, Innovation, Empire building, Leverage, Dividend, Corporate governance

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1. Introduction

The perception of CEO-power as largely self-serving is a natural one (see, e.g., Bebchuk, Fried, and Walker (2002)). Prior studies suggest that CEO power has a negative effect on corporate outcomes¹. As CEOs gain more control over corporate boards, agency problems may lead to empire-building motivated investment inefficiencies such as an increase in the number of investments and decrease in investment quality (Pan, Wang, and Weisbach (2016)). However, there may be a counteracting mechanism that realigns the often-distorted policies of powerful CEOs, to be value enhancing for shareholders through reallocation of capital.

Using the concurrent passage of the Sarbanes-Oxley Act and NYSE/NASDAQ listing regulation changes (collectively, "SOX") as a natural experiment that brought about exogenous changes in internal governance of the firms through changes in regulatory mandates, we analyse the impact of CEO power on corporate policy choices. In particular, the study challenges the notion that powerful CEOs are detrimental for all firms exploring the heterogeneity in firms' pre-SOX governance. We show that a powerful CEO coupled with poor corporate governance drives the negative view of powerful CEOs. An exogenous improvement in the governance of the firm may bring strategic shift in firms with powerful CEOs and thus divert the energy and efforts of powerful CEOs to value-enhancing projects.

A key mechanism of corporate governance to discipline the behavior of self-serving managers is the board of directors, a market solution to an organizational design problem (Hermalin and Weisbach (1998)). This mechanism is particularly important in the context of powerful CEOs, as they may have more ability and/or authority to make decisions and adopt policies that may not be in the best interest of shareholders. Powerful CEOs may engage in empire building (Pan et al., 2016) and avoid value enhancing strategic investments such as Research and Development (R&D). However, managerial incentives in exercising power in the context of sub-optimal capital allocation decisions could be restrained or ameliorated by

¹ See, for example, Ryan and Wiggins (2004), Adams, Almeida and Ferreira (2005), Bebchuk et al. (2002), Bebchuk, Cremers and Peyer (2011), Morse, Nanda and Seru (2011), Landier, Sauvagnat, Sraer and Thesmar (2013), Khanna, Kim and Lu (2015), Han, Nanda and Silveri (2016).

the board of directors (Mace (1971), Fama and Jensen (1983)). Likewise, if deemed necessary, properly functioning boards of directors may make a contrarian opinion when CEOs proposals are not in the best interest of the firm's shareholders².

A complicating factor, however, is that firm corporate governance structures are endogenous³ and thus identifying the true moderating effect of corporate boards on CEO power is challenging. Powerful CEOs can use their influence to select board of directors to ensure a pliable board (Tirole (2001)). For example, AT&T's board members were criticized for being one of the most *passive boards* in corporate America while Robert Allen was the CEO of the company and acquired McCaw Cellular in 1992. The failure of this investment resulted in losses of billions of dollars, a sharp decline of stock growth and elimination of more than 100,000 jobs (Keller (1997)). Thus the corporate directors could be less diligent in monitoring management and thus turn a blind eye to manager's agenda when CEO power is higher (e.g., Zajac and Westphal (1996), Hermalin and Weisbach (1998), Cohen, Frazzini and Malloy (2012)).

We use the concurrent passage of the Sarbanes-Oxley Act of 2002 (SOX) and NYSE/NASDAQ listing regulation changes (collectively, "SOX") as a natural experiment which brought about exogenous changes in the internal governance of the firms from changes in regulatory mandates⁴. Graham, Kim, and Leary (2017) report that average board independence increased to over 70% by 2011 following the introduction of the SOX and amendments to NYSE and NASDAQ listing requirements. They claim that these regulations might, therefore, reduce the ability of powerful CEOs to decrease board independence. Thus, this natural experiment enables us to draw causal inference on the effect of CEO power on firm-level policies in an environment characterized by the strengthening of oversight through independent audit committees and boards of directors.

Though the SOX is considered to be the most important legislation since the original securities laws of the 1930s (Donaldson (2003)), the empirical evidence on the effect of the SOX on corporate policies is inconclusive (see, Coates and Srinivasan (2014)). We argue that

² Lorsch (1995) asserts that ".....if top management consistently disregards the directors' advice, an empowered board is more likely to be forceful in expressing its opinions."

³ See, for example, Demsetz and Lehn (1985), Hermalin and Weisbach (1988), (1998), (2003), Himmelberg, Hubbard and Palia (1999), Palia (2001), Coles, Daniel and Naveen (2007), Bhagat and Jefferis (2002), Becht, Bolton and Röell (2003).

⁴ See Banerjee, Humphery-Jenner, and Nanda (2015), Linck, Netter, and Yang (2009), Guo, Lach, and Mobbs (2015), Guo and Masulis (2014), Duchin, Matsusaka and Ozbas (2010).

the inconclusive or weak findings of the effect of the SOX on corporate policies in the literature are potentially attributable to the failure to explicitly consider the heterogeneity in underlying firm governance mechanisms at the time of enactment of these regulations. For example, the directors of the Archer-Daniels-Midland Company approved a series of proposals to turn majority control of the board over to a group of outside directors in 1996 in response to widespread criticism of insider domination of the company's board (Eichenwald (1995)). Thus, some companies were compliant with the requirements of the SOX before its passage.

We consider the pre-SOX cross-sectional heterogeneity in a firm's corporate governance quality by partitioning the sample by the degree of compliance with the required thresholds of the SOX: the pre-SOX *Compliant Firms* (henceforth *Compliant Firms*) and the pre-SOX *Non-Compliant Firms* (henceforth *Non-Compliant Firms*). We argue that firms with the majority board independence and fully audit committee independence even before the SOX and thus been compliant with the SOX before it became mandated, are arguably better governed than other firms. Thus, the SOX is unlikely to be an "exogenous shock" for these firms. More importantly, any self-serving strategies by the powerful CEOs would, arguably, be mitigated by the monitoring of the empowered boards. However, for *Non-Compliant Firms*, the passage of the SOX is more likely to be an "exogenous shock". Moreover, the apparent self-dealing strategies of powerful CEOs in *Non-Compliant Firms* remain unchecked and under-supervised by truly independent, vigilant and expert boards of directors.

We explore the impact of CEO power on corporate policy choices including innovation, capital expenditure, property, plant, and equipment and total asset growth, leverage, and dividends. Pan et al. (2016) argue that investment in intangible capital and physical capital could be subject to different agency incentives and that CEO's preference to grow his firms beyond what is optimal for shareholders could be more relevant for physical rather than intangible investments. Thus, we examine both the quantity and the quality of investments in physical or tangibles assets and in intangibles.

The results suggest that in the pre-SOX period, powerful CEOs, on average, engage more in empire building compared to less-powerful CEOs. Specifically, powerful CEOs led *Non-Compliant Firms* are associated with higher tangible investment growth (capital expenditures (CAPEX), property, plant, and equipment (PPE) and total assets). In contrast,

they invest less in risky R&D investments, and as such are associated with inferior innovation outcomes measured by the quantity of innovations (patents) and the quality of innovation (citations). In the similar vein, *Non-Compliant Firms* with powerful CEOs have lower quality investments (proxied by the market reaction to M&A announcements) but have a higher level of acquisitiveness (number of deals). In addition, as powerful CEOs value control, their firms have a higher degree of financial leverage and pay lower dividends.

However, in the post-SOX period, *Non-Compliant Firms* with powerful CEOs, on average, engage less in empire building (pursue lower growth in CAPEX, PPE, and total assets), make higher quality investments (positive announcement returns on M&A deals) but fewer acquisitions. In addition, they invest more in productive value enhancing R&D investments and importantly, the increase in R&D spending significantly increases the corporate innovation productivity. We also find the evidence of value creation in the post-SOX period, in that *Non-Compliant Firms* with powerful CEOs introduce higher quality new products. Further, they pay more dividends and reduce debt financing in the post-SOX period.

The moderating effects of SOX are weak for the sample of *Compliant Firms* which supports our conjecture that the SOX-driven improvement in firm-level governance is beneficial for firms that were more in need of such an exogenous shock that is those with weaker governance. The results are robust to the use of firm fixed effects, year fixed effects and industry-year interacted joint fixed effects which reduce the concern that time-varying industry shocks may drive our findings.

We also include other measures of CEO power such as CEO Pay Slice (Bebchuk, Cremers, and Peyer (2011)) and the CEO is the only insider on the board (Adams et al. (2005)) and find similar results. We control for CEO overconfidence (Banerjee et al. (2015)), institutional holdings (Aghion, Reenen and Zingales (2013)), dual class stock (Masulis, Wang and Xie (2009)) and board size (Yermack (1996)) and find consistent results.

We also conduct additional tests using the Entrenchment index (E-index) (Bebchuk et al. (2009)). We find that the benefits from post-SOX improved decision making are concentrated in the firms that are otherwise poorly governed (above median E-index value) in the pre-SOX periods.

Our study contributes to the literature in several ways. Firstly, contrary to the popular perception of the self-serving behavior of powerful CEOs (Bebchuk et al. (2002)),

Morse et al. (2011)), we show that the improvement in governance induced by exogenous regulatory changes can channel or divert the misaligned efforts of powerful CEOs to value-enhancing projects. We also show that improved decision making in the post-SOX period benefited the firms that were more in need of exogenous changes in governance to discipline powerful CEOs: poorly governed firms.⁵

Secondly, contrary to Han et al. (2016), our results may explain why some firms still appoint or continue to have powerful CEOs. Similar to Li, Lu, and Phillips (2016), we also highlight the “bright side” of CEO’s power. Nevertheless, our study differs from Li et al. (2016), who explore product market heterogeneity (for example, dynamic and competitive product market) to explore the contextual importance of CEO’s power. We explicitly consider the endogenous nature of firm governance and provide evidence from a quasi-natural experiment, the enactment of SOX, on the counteracting role of the corporate board in restraining powerful CEOs.

Finally, despite the economic significance of the SOX⁶, the effectiveness of this regulation has been sceptical in critics (see, Romano (2004)) and scant in empirical analyses. One plausible reason of limited empirical evidence on consequences of the SOX could be the difficulty to quantify benefits of the SOX (Coates (2007)). Our study attempts to fill that gap by empirically evaluating the moderating effect of the SOX on a particular type of powerful CEOs whose power was unchecked by more capable, well-functioning corporate boards before the enactment of the SOX. We show that improvement in corporate decision making or reduction in self-serving behavior by powerful CEOs is concentrated among *Non-Compliant Firms*. This result does not consistently hold for *Compliant Firms*. Thus, consistent with the previous literature, we argue that the effectiveness of the SOX, on average, could be inconclusive. But the enactment of the SOX has fundamental impact in governing the unbridled power of CEOs.

The rest of the paper is organized as follows: Section 2 focuses on literature review and hypotheses development. We describe the data and sample in Section 3. Empirical analyses are presented in Section 5. Section 6 concludes the paper.

⁵Tang, Crossan, and Rowe (2011) show that powerful boards of directors can reduce the likelihood of a CEO harming a firm because they are more likely to screen out and oppose unsound business decisions. They also argue that having dominant CEOs is risky, but powerful boards help control the downside risks while leaving the upside potential relatively open.

⁶ Coates (2007) argues that the SOX should bring long-term benefit to economy through better allocation of resources, greater transparency and faster growth.

2. Motivation and hypothesis development

The classical model of managerial discretion of Williamson (1964) highlights managerial incentives for using their 'discretion' to implement corporate policies which would maximise their own utility rather than maximising shareholder utility. Thus, when the firm's decision-making forum is dominated by powerful CEOs and the absence of independent monitors hinders the diversity of opinions, we argue that self-serving decision making is more pronounced. However, evidence suggests that SOX has improved disclosure and subsequently firm governance and monitoring (e.g., Coates (2007)). The SOX has strengthened the monitoring role of independent directors, increased the personal responsibility of corporate leaders for financial disclosure and has increased the diversity of opinions at board level, thus helping to discipline powerful CEOs. So, we expect that the implementation of the SOX has reduced or reversed sub-optimal decision making by powerful CEOs in the post-SOX period. Nevertheless, the regulatory provisions of SOX are more likely to be an "exogenous shock" only for *Non-Compliant Firms*.

2.1. Strategic investments: R&D

R&D investments are essential in enhancing technological know-how and allow the firm to remain innovative and obtain competitive advantages. The important characteristic that distinguishes R&D investment from other strategic investments is the highly uncertain and skewed returns of R&D investments. These investments are time-consuming and entail failure-intensive outcomes (see, e.g., Scherer (1998), Scherer and Harhoff (2000)). Compared to their non-powerful peers, powerful CEOs might derive more disutility from R&D investments as they value control over larger resources and failed investments in R&D may dissipate those resources. Moreover, successful R&D programs require a corporate culture that allows for the freedom to experiment and tolerates failure to motivate innovation among employees of large corporations (Farson and Keyes (2002), Sutton (2002)). Although Hillman and Dalziel (2003) suggest that board incentives are key moderating factors between board capital and resource provision, Chen (2014) shows that powerful CEOs have the ability to influence the relationship between board capital and R&D investment and thus influence the magnitude of R&D investments in an organization.

Barker and Mueller (2002) suggest that CEO preferences for various levels of R&D spending are associated with visible CEO characteristics such as age, tenure, education,

career experiences, and stock ownership. They show that the impact of a CEO's effects on relative R&D spending increases with tenure implying that CEOs, over time, may mold R&D spending to suit their preferences. Grimm and Smith (1991) show that longer-tenured CEOs make fewer changes in strategy. This is consistent with a stronger commitment by long-tenured CEOs in implementing their own paradigm for how the organization should be run (see, e.g., Hambrick and Fukutomi (1991)). R&D investments may not be compatible with the inflexible strategies of long-tenured CEOs. As longer tenure and larger ownership stakes make CEOs powerful across firms and over time, powerful CEOs in *Non-Compliant Firms* are more likely to invest less in R&D.

Strategic investments such as R&D have long-term value implications for outside shareholders and thus we expect that the introduction of SOX leads to a reduction in under-investment by powerful CEO run firms in the post SOX period. However, the effects of SOX in reducing under-investment in R&D projects by powerful CEOs would be more pronounced among the *Non-Compliant Firms*. Therefore, our hypothesis is:

Hypothesis 1: SOX reduces under-investment in R&D projects by in Non-Compliant Firms with powerful CEOs.

2.2. Investments in tangibles assets: Empire building

Rajan and Zingales (1998) discuss how the ability to grab power can be used to design corporate investment policy. They argue that a fear that others will grab power, may lead to excessive power-seeking which, in turn, may prevent otherwise value-enhancing transactions from taking place. Rajan Servaes and Zingales (2000) document that power struggles within a company may lead to distortions in capital allocation. Kumar et al. (1999) show that an efficient legal system eases managerial power captured through management's ability to use critical resources and thus leads to the establishment of larger firms. McNeil and Smythe (2004) find evidence that divisional managers' lobbying power is positively correlated with a segment's capital expenditures.

The agency cost hypothesis predicts that CEOs of firms where information hoarding is high, such as firms led by powerful CEOs, can make (suboptimal) self-maximizing decisions (Hope and Thomas (2007)). These suboptimal decisions include "empire building," where as stated by Jensen (1986), managers have incentives to cause their firms to grow beyond the optimal size and growth increases managers' power by increasing the resources under their

control. These decisions could be reflected through poor operating performance and reduction of firm value.

Empire building could be achieved via growth in capital expenditure, property, plant and equipment and total assets. Since powerful CEOs, arguably, would like to lead firms of larger size, they are likely to grow investments in capital expenditures faster compared to other CEOs (Li et al. (2016)).

Pan et al. (2016) show that as CEOs' tenure increases, their power over the board increases. CEOs are often reluctant to divest or re-optimize bad investments that they have made due to private benefits or career concerns. Often board governance practices permit long-tenured powerful CEOs to overinvest or engage in empire building (Baldenius, Melumad and Meng (2014), Jensen (1993)).

However, we expect the SOX to reduce the propensity of powerful CEO run *Non-Compliant Firms* to grow too fast. In other words, we expect the growth policies of powerful CEO run firms to be moderated by independent boards who bring a diversity of opinion to decision-making forums. Hence, our next hypothesis is:

Hypothesis 2: SOX reduces over-investment in CAPEX, PP&E and Total Assets by Non-Compliant Firms with powerful CEOs.

2.3. Dividend policy

Similar to capital structure decisions, the payout policy of firms with powerful CEOs could also differ. Firms' payout policies often cause major agency conflicts (e.g., Jensen (1986)) as the availability of free cash flow resulting from a firm's payout policy may lead to engagement in wasteful investment or extraction of perks. Since they value control over resources, powerful CEOs may limit dividend payouts to shareholders. The entrenchment hypothesis argues that CEOs who may fear disciplinary actions are inclined to pay higher dividends as a shield against such actions (e.g., Zwiebel (1996), Fluck (1999), Allen, Bernardo and Welch (2000)). However, the incentive to pay dividends as a monitoring device could be negligible for powerful CEOs who can fend off takeover threats (e.g., Stulz (1988)). Powerful CEOs who might have moral hazard problems (see, e.g., Campbell and Marino (1994), Hirshleifer and Thakor (1992), Narayanan (1985)) could further induce agency conflicts by paying limited dividends and using free cash flows to invest in value-reducing projects.

As the SOX has a disciplining effect and a resultant improvement in governance, we argue that the SOX reduces the tendency of powerful CEOs in *Non-Complaint Firms* to pay lower dividends. Hence, our another hypothesis is:

Hypothesis 3: The SOX increases dividend payments by Non-Compliant Firms with Powerful CEOs.

2.4. Financial Leverage

CEOs can gain incremental power by holding large stock ownership in the firms (Cyert, Kang, Kumar and Shah (1997), Holderness and Sheehan (1988)) and prefer to maintain that ownership percentage. Jensen and Meckling (1976) suggest that in order to avoid dilution of ownership, firms led by powerful CEOs are less likely to issue equity capital compared to other firms to finance their growth. Thus, in order to finance growth in their firms (such as tangible assets), powerful CEOs are more likely to depend on financial leverage from debt capital to avoid dilution of ownership from further issuance of equity.

Jung et al. (1996) claim that the agency model where managers pursue their own objectives by increasing firm's growth at the expense of shareholders is more pronounced in extending leverage. Shleifer and Vishny (1989) suggest that managers may seek to entrench themselves by investing in assets which are more profitable under their management than under the management of their closest competitors irrespective of such investments being value-increasing or not. As such, powerful CEOs, motivated by empire-building, may increase the financial leverage ratio of their firms to invest in value-destroying projects if these investments bring private benefits to them at the cost of a heightened level of monitoring from debt-holders.

Exogenous enhancements in the monitoring quality of corporate boards following the SOX may impact the use of leverage in powerful CEO run firms, particularly if leverage ratios are not optimal for these firms. Moreover, financial disclosure, among other monitoring mechanisms, is vital for disciplining managerial activities. Since the SOX has mandated provisions to improve accounting reporting and disclosure quality alongside holding the top corporate executives personally liable for the quality of reported statements, we expect a moderating effect on financial leverage used by powerful CEOs in the post-SOX period. Hence, our hypothesis is:

Hypothesis 4: The SOX reduces leverage in powerful CEO run Non-Compliant Firms.

3. Sample and Data

Our primary sample consists of the universe of firms contained in the Standard and Poor's Executive Compensation (ExecuComp) database from 1992-2014. Following the standard literature, we exclude financial firms (Standard Industrial Classification [SIC] codes 6000-6999) and regulated industries (SIC codes 4900-4949). We combine the ExecuComp data set with Compustat for financial and accounting data. The Centre for Research in Security Prices (CRSP) dataset provides stock price information. Most of the CEO characteristics variables are from the ExecuComp database. After excluding observations with missing data on CEO power components, we obtain a sample size of 30,754 firm-year observations.

A concern with using these regulatory changes as an identification strategy is that powerful CEOs may be replaced during the SOX period. Thus, the changes in capital allocation policy may be driven by new CEOs whose power structure, leadership style and choice of corporate policies could be significantly different from the powerful CEOs in the pre-SOX period. We address this concern by analyzing the impact of powerful CEOs on corporate policies after excluding firms that experience turnover of CEOs around the SOX in 2002 (i.e., for whom the CEO in 2001 is different from the CEO in 2003). Thus our final sample includes 1,102 unique firms with 2,909 CEOs and 18,396 firm-year observations.

CEO power:

CEOs derive power generally from four areas - structural, ownership, expertise, and prestige (Finkelstein (1992)). For example, CEOs may increase their power through holding the position of chairman of the board and/or holding the title of other top corporate executive such as President or Chief Operating Officer thereby dominating the decision-making forum. Additional power may also be derived from their status as a founder of the firm, from retaining significant holdings of the firm's equity and through longer tenure as CEO.

In this study, the main explanatory variable, "*CEO power*" is an index and we follow Finkelstein (1992) and Daily and Johnson (1997) to identify major sources of managerial power in constructing the index. The index components include founder CEO, CEO-Chair duality, title concentration, tenure and ownership.

Founder CEO:

A source of CEO power is whether a CEO is also a founder of the company (Adams et al. (2005), Li et al (2016)). Prior studies show that CEOs, through their status as founders, are able to exercise wide-ranging control over the firms' operating, capital allocation and strategic decision-making processes (Anderson and Reeb (2003), Adams, Almeida and Ferreira (2009), Fahlenbrach (2009)).

We hand-collect information on founders such as names and number of founders of each firm and founding year, for sample firms. We use several sources including 10-K filings of the firms with the SEC available in Electronic Data-Gathering, Analysis, and Retrieval (EDGAR), the Funding Universe website, company websites, and other Internet resources including Wikipedia, Forbes pages, Bloomberg's Business Week website, among others. 'Founder-CEO' in a given year is an indicator variable that equals one if any source explicitly mentions that the current CEO is one of the original founders of the firm or was the main executive at the time the company was founded (see: Adams et al. (2009), Fahlenbrach (2009)).

CEO-Chair duality:

Much attention in the corporate governance literature has been given to CEO-chair duality. The CEO and chairman roles have responsibilities that overlap in many respects, at least in appearance, but also differ in key ways. Jensen (1993) points out that "the function of the chairman is to run board meetings and oversee the process of hiring, firing, evaluating, and compensating the CEO." In the presence of CEO-chair duality, this important function is compromised. CEO-chair duality would also give CEO's much greater say (power) on the workings of the board and thus affects a company's performance (Jensen (1993), Brickley, Coles, and Jarrell (1997)). 'CEO-Chair' equals one if CEO is also the chairman of the board (Li et al. (2016), Han et al. (2016)). We use ExecuComp to identify whether the current CEO is also the chairman of the board.

Title concentration:

CEO title concentration is narrower than CEO-chair duality in that it applies when a CEO, who is also chairman, additionally holds any one, or more, of a number of other senior posts (titles), including COO, President, and CFO. Each of these roles on their own is an influential leadership role within the firm and captures structural power (Finkelstein (1992)). As such when combined with the CEO-chair, they arguably confer much greater power on

the CEO-chair (Li et al (2016), Han et al. (2016), Adams et al. (2005)). Morck, Shleifer and Vishny (1988) define CEOs as powerful when no other person holds the title of president or chairman and no other person co-signs the letter to the shareholders in the annual report. ‘*CEO title concentration*’, is a dummy variable which is one if CEO’s hold more than two titles and zero otherwise.

Tenure above industry median:

A CEO’s experience, firm-specific knowledge, and expertise accumulated with tenure, can influence a firm’s corporate policy (Hermalin and Weisbach (1991), Brookman and Thistle (2009)). CEOs with tenure that is longer than the industry median should be more powerful than other CEOs (see: Han et al. (2016)). Tenure data is collected from ExecuComp. However, the tenure measure from ExecuComp may be incorrect for CEOs who leave their managerial position and return to the focal firm of analysis later in the sample period. For these CEOs, we hand-collect tenure data from the sources used to collect the founder data. Finally, we create a dummy tenure variable as a component of ‘CEO Power’ which is one if the tenure of CEO is above the industry median (See: Han et al. (2016)). This variable allows us to capture both expert and prestige power (Finkelstein (1992)).

Ownership above industry median:

CEOs with significant shareholdings have the ability to influence important firm decisions in an ownership capacity, prevent involuntary dismissal and thus are likely to be more powerful (Daily and Jonson (1997)).

We construct a ‘CEO Ownership’ variable which is one if the ownership of CEO is above the industry median (See: Han et al. (2016)). The ‘*CEO Power*’- index is an aggregate measure of the five components of CEO power and thus the index value ranges from 0 to 5. We also use an indicator variable – ‘*CEO Power TOP-Q*’ which is one if ‘*CEO Power*’ index is in the top quartile of the industry.

3.1. Dependent variables

We use two measures of capital investment. The first measure is a firm’s strategic risky investment which is measured as R&D scaled by total assets. We also examine the impact of powerful CEOs on innovation-the outcome of R&D investment. Following the extant literature (e.g. Hirshleifer et al. (2012)), we use the number of patents applied for (and subsequently granted) as a proxy for the quantity of innovation. To distinguish major

technological breakthroughs from incremental technological improvements, we also use the number of citations received by these patents to measure the quality of innovation.⁷

The patent data are mainly from the Kogan et al. (2012) (henceforth KPSS) Patent dataset. The KPSS patent dataset provides data for all patents that are granted by the U.S. Patent and Trademark Office (USPTO) over 1926-2010. The dataset provides information for each patent such as the names of the assignees, the number of patents and the number of citations received by each patent. We follow the innovation literature and date the patents by the year of their application (Hall et al. (1986)). We restrict the sample to patents applications up to 2008 as patents applied for after 2008 may not appear in the dataset because of the time lag in granting patents. We use the KPSS (2012) patent data instead of the NBER patent data as it allows us to identify comprehensive patent portfolios up to 2008, compared to 2004 for the NBER patent data. The merged dataset includes 11,352 firm-year observations with 9,79 unique firms and 1,969 CEOs.

We also explore the impact of CEO power on the market reaction to new product announcements. The data on the market reaction to a new product announcement is from Mukherjee, Singh and Žaldokas (2017). Mukherjee et al. (2017) dataset for 1990-2006 is created by a textual search of the LexisNexis News database for company press releases that are tagged under the subject “New Products” and where their headlines include keywords (with the roots of words) such as “Launch,” “Product,” “Introduce,” “Begin,” “Unveil”. We use standard event study methodology, where cumulative abnormal returns (CARs) are estimated over the three (-1, 1) day period around the press release of the product announcement. We create two variables: ‘*ann_cum*’ and ‘*ann_75*’. The variable ‘*ann_cum*’ is the sum of all positive cumulative abnormal returns over the year. The count of the number of announcements with cumulative abnormal returns above the 75th percentile is represented by ‘*ann_75*’. This allows us to analyse the product market conditions of the firms which could be influenced by corporate innovation.

As the second measure of capital allocation policy, we use growth in CAPEX, total assets and PPE to proxy for empire-building activities of CEOs (Xuan (2009), Chen Lu and

⁷ Studies employing these two variables to measure innovation performance include among others Hirshleifer et al. (2012), Seru (2014), Tian and Wang (2014), He and Tian (2013), Hsu et al. (2014) Fang, et al.(2014), Chemannur and Tian (2013), Bereskin and Hsu (2012), Kang et al. (2014), Atanassov (2013)

Sougiannis (2008). We also explore the Merger and Acquisition (M&A) activities of the powerful CEOs. We use the Securities Data Corporations (SDC) U.S. M&A database to identify all completed corporate M&As from 1992-2012. Following Masulis, Wang and Xie (2007), only the completed deals having value of more than one million dollars are selected for the analysis. We also require that the acquirers must control less than 50% of the target company before acquisition and control 100% of the target after acquisition. Finally, we require that the deal value must be at least 1% of the acquirer's market value of equity measured on the 11th trading day prior to the announcement date. The merged dataset includes 4418 unique deals made by 787 unique firms.

We further explore the capital structure and payout policy of firms with powerful CEOs. The analysis focuses on the use of leverage (measured as total debt over total assets) of firms with powerful CEOs. To proxy the firm's payout policy, we use dividends paid scaled by total assets.

3.2. Control variables and rationale

As per the literature, we control for the determinants of corporate policies. The firm-level controls include firm size (natural log of market value of equity of the firm (Bushee (1998))⁸, capital expenditures (ratio of CAPEX to sales), R&D expenditures (R&D scaled by the book value of assets), asset growth and leverage (long-term debt scaled by total assets) (Banerjee et al. (2015), Bushee (2001)). We also control for profitability (Earnings before interest and tax [EBIT] scaled by total assets) as a firm's profitability and market performance significantly influence the firm's access to funds and subsequent investment (Kaplan and Zingales (1997), Fama and French (2016), Rajan et. al. (2000)). We use Tobin's Q (Market value of assets over book value of assets) as a determinant of the firm's capital allocation decisions as Bushee (1998) claims that firms with higher Tobin's Q may have better R&D opportunities and face a higher cost of reducing R&D for myopic reasons. We use time fixed effects to capture firm or industry specific changes over time and firm (industry) specific unobserved heterogeneity is controlled using firm (industry) fixed effects.

⁸ Chemmanur and Tian (2013) and Sapra et al. (2014), among others, use natural log of assets to measure firm size. Hirshleifer et al. (2012) and Kang et al. (2014), among others, use natural log of sales to measure firm size. Our results are robust using alternative measurements of firm size.

3.3. Summary statistics

We report descriptive statistics of the variables in Table 1. Panel (A) of Table 1 reports summary statistics of the components of the powerful CEO index. Approximately 18% of firm-year observations have CEOs that are also founders of their firms. The CEO also holds the chairman position in around 60% of firm-year observations in our sample. In approximately 25% of firm-year observations, the CEO-Chair also holds other titles. The average CEO's ownership is 3% and the average CEO tenure is around 8.86 years. These measures are similar to prior studies (Li et al. (2016), Han et al. (2016), Adams et al. (2005)). Finally, the '*CEO Power*' variable has a mean value of 2.02 with the 75th percentile having an index value equal to 3. Thus '*CEO Power Top Q*' has a mean value of 0.16. Panel B of Table 1 reports the correlation matrix of the individual sources of power and the CEO power index.

We report firm-level descriptive statistics in panel C. The average firm size in our sample is large (\$6.8 billion) as the sample consists of S&P1500 firms. The firm's average profitability and leverage ratios are 9% and 19% respectively. The average Tobin's Q of the firms is 2.17 with a median of 1.66. The average asset growth is 9% whereas the average PPE growth is 7%. The average number of patents and citations in the period (t+1) are 1.08 and 1.60 respectively.

<<Insert Table 1 about here>>

We also define a powerful CEO run firm (indicator variable, '*CEO power Top Q*') when the CEO's power score is in the top quartile of the industry-year distribution of *CEO power* measure. We report summary statistics for all firm-year observations in Panel D. The average market size of the firms run by powerful CEOs is smaller than firms with non-powerful-CEOs. These firms have a significantly higher Tobin's Q (2.35), higher asset growth (11%) and PPE growth (9%) and higher leverage (17%).

4. Empirical Analysis

4.1. Powerful CEOs, long-term strategic investments and the SOX

In this section, we analyse the impact of powerful CEOs on long-term focused strategic investments such as R&D. We employ the following OLS regression model using difference-in-difference tests:

$$\frac{R\&D_{(t+1)}}{Assets_{i,t}} = \alpha + \beta_1 SOX_{i,t} \times CEO - Power_{i,t} + \beta_2 CEO - Power_{i,t} + \beta_3 SOX_{i,t} + \gamma_{i,t} + \phi_t + \lambda_{j(i)} + \varepsilon_{i,t} \quad (1)$$

Where, γ represents a set of control variables, ϕ_t and $\lambda_{j(i)}$ are year and industry (firm) dummies, respectively. SOX is an indicator dummy that equals one if the observations occur in 2002 or later and zero otherwise. CEO power is proxied by the CEO-power Index or CEO-power Top Q. We cluster standard errors at the firm-level. To examine the impact of the SOX on strategic long-term investment decisions by powerful CEOs, we include an interaction dummy (SOX x CEO power). The results of the regressions are in Table 2.

<<<<Insert Table 2 about here>>>>

Initially, we report the full sample results using industry and year fixed effects in column (1) including the SOX indicator and the interaction term (SOX x CEO power). We use firm fixed effects in column (2). The coefficients of CEO power are negative and significant. Most importantly, the coefficients on the interaction term of columns (1) and (2), ‘SOX x CEO power’ are positive and economically and statistically highly significant. The results suggest that on an average, in the pre-SOX periods, powerful CEOs invested less in risky R&D investments. However, after the passage of the SOX, powerful CEOs invested more in R&D projects relative to other CEOs.

We divide the sample on the basis of whether firms were already compliant with the provisions of SOX, before SOX was enacted. We define ‘Compliant Firms’ as those with both a majority independent board and fully independent audit committee before SOX (1998-2001) and others as ‘Non-Compliant Firms’. The results in columns (3) and (4) suggest that the full sample results are mostly driven by powerful CEOs in ‘Non-Compliant Firms’.

Columns (5) through (8) report the binary measure of CEO power-‘CEO power Top Q’. The results are qualitatively similar to results reported in columns (1) through (4). Overall, the results suggest that powerful CEOs in *Non-Compliant Firms* generally avoid investments in risky projects such as R&D. However, the increase in R&D investment after the introduction of the SOX is consistent with our hypothesis that the SOX reduces the underinvestment in R&D by *Non-Complaint Firms* with powerful CEOs

4.1.1 Powerful CEOs, Innovation and SOX

The above results suggest that in the post-SOX period, *Non-Compliant Firms* with powerful CEOs invest more in R&D projects. However, R&D is an innovation input and

powerful CEOs may impact innovation performance. We use standard measures of innovation output from the literature, the number of patents grants received to measure the quantity of innovation and the number of forward citations received by these patents to measure the quality of innovation. The innovation performance results using the continuous measure of powerful CEOs (binary measure of CEO power) are shown in Table 3a (Table 3b).

In all specifications, we control for contemporaneous R&D spending following the innovation literature (Sevilier and Tian (2012), Tian and Wang (2014)). Provision of sufficient access to innovation inputs (R&D expenditure) is a necessary but not sufficient condition for innovation success. Since it is plausible that powerful CEOs could invest more in R&D to achieve above-average innovation success, we control for R&D scaled by total assets to capture innovation efficiency.

<<<<Insert Table 3a about here>>>>

<<<<Insert Table 3b about here>>>>

The results suggest that in the pre-SOX period, powerful CEOs have a negative impact on innovation performance (both quantity and quality). This negative impact is concentrated among the *Non-Compliant Firm* sample whereas CEO power has an insignificant impact on innovation performance for *Compliant-Firms*. In the post-SOX period, the results suggest that powerful CEOs have better innovation performance. The coefficients on the interaction term, '*SOX *CEO power*', are positive and significant in all columns. Specifically, in the post-SOX periods, firm with powerful CEO had better innovation performance. However, the results in columns (2) and (3) suggest that the improvement in innovation performance is stronger for *Non-Compliant Firms*. We find qualitatively similar results using the interaction term '*SOX x CEO Power Top Q*' (see, Table 3b).

4.1.2 Powerful CEOs, SOX and Value of R&D investments:

It could be argued that the post-SOX increase in innovation productivity of firms with powerful CEOs could come from other firm-level changes due to the SOX, rather than an increase in R&D investment. We test this using a triple-interaction test of CEO power, SOX and R&D. We run the following regressions:

$$\begin{aligned}
 Patents_{t+k,i} = & \alpha + \beta_1 SOX_{i,t} x CEO - Power_{i,t} x R\&D_{i,t} \\
 & + \beta_2 SOX_{i,t} x R\&D_{i,t} + \beta_3 CEO - Power_{i,t} X R\&D_{i,t} \\
 & + \beta_4 SOX_{i,t} x CEO - Power_{i,t} + \beta_5 CEO - Power_{i,t} + \beta_6 SOX_{i,t} + +\beta_7 R\&D_{i,t} \\
 & + \phi_t + \lambda_{j(i)} + \varepsilon_{i,t}
 \end{aligned}$$

If the post-SOX increase in R&D investment increases innovation performance rather than wasting valuable corporate resources, we would expect the coefficient on the triple interaction term to be positive and significant. The results are presented in Table 4.

<<<<Insert Table 4 about here>>>>

The coefficients on the triple interaction terms for all firms (columns (1) and (4)) are positive and significant. This suggests that the higher level of R&D investment by firms with powerful CEOs, was effective in generating patentable corporate intangible assets. However, the results are consistent and stronger for *Non-Compliant Firms* (columns (2) and (5)). While there is evidence on effective R&D investment for the *Compliant Firms* using the continuous measure, the results are insignificant for the indicator based measure of CEO power (*'CEO Power Top Q'*).

4.1.3 Powerful CEOs, Innovation and Value creation:

The previous results suggest that in the post-SOX period, there is an increase in R&D investment and innovation productivity of firms with powerful CEOs. However, the increase in innovation productivity, particularly the increase in patents, should translate to direct value creation for the shareholders to justify the increased spending in R&D. More specifically, if the patent portfolios of firms with powerful CEOs are valuable, we would expect these firms to introduce major breakthrough products into the market. Li et al. (2016) document that granting power to CEOs could lead to higher corporate investment measured by capital expenditures and advertising expenditures and increase the growth of new products in dynamic and competitive product markets.

<<<<Insert Table 5 about here>>>>

The announcements of major breakthrough products are found to have a positive abnormal stock return (Chaney and Devinney (1992)). In this section, we test how the market reacts to major product announcements using data from Mukherjee et al. (2016) for 1992-2006. Due to data constraints, our sample size reduces to 2,601 firm-year observations. The results are in Table 5.

We find that in the post-SOX period, firms led by powerful CEOs introduced more breakthrough products that earned positive abnormal announcement returns that were above the 75th percentile of the abnormal returns distribution. However, the relationship is only significant for the pre-SOX *Non-Compliant Firms* (column (2)).

We consider total cumulative abnormal returns in columns (4)-(6) and show that that in the post-SOX periods, the market values new product announcements by powerful CEO run firms more positively. Again, the effect is pronounced for the pre-SOX *Non-Compliant Firms* (column (5)). This is consistent with the findings of higher quality innovation by *Non-Compliant Firms* with powerful CEOs in the post-SOX period. We find similar results using 'CEO Power Top Q'.

4.2. Powerful CEOs, Empire building investments in tangible assets and SOX:

In this section, we test our hypothesis regarding empire building by powerful CEOs. We use growth in Capital Expenditure (CAPEX), Property, Plant and Equipment (PPE) and Total Assets as the dependant variables and examine the disciplining effect of the SOX on powerful CEOs in Table 6.

<<<<Insert Table 6 about here>>>>

The results in Table 6 show that firms with powerful CEOs, are generally associated with higher growth in capital expenditures, Total Assets and PP&E in the pre-SOX period (columns (1), (4) and (7)). However, there is a reversal in these growth rates following the passage of SOX as the coefficient on the interaction term is negative. Consistent with our hypothesis, the results are driven by the pre-SOX *Non-Compliant Firms* (columns (2), (5) and (8)). Consistent with Cohen, Dey and Lys (2004), we find that SOX had a negative effect on asset growth rates.

Powerful CEOs who have a preference for making tangible investments with the objective of increasing the visible size of their firms (empire building), will invest more in tangible assets. The results suggest that the introduction of SOX has constrained asset growth in firms with powerful CEOs and thus reduced their ability of empire building. We find consistent results using the binary measure instead of the continuous measure of CEO power.

We further explore empire building hypothesis using the evidence from M&A deals of powerful CEOs. Because powerful CEOs being elicited by personal gratification, may build their own *Luxembourg* through M&A deals and thus signal their phenomenal status in their organizations. In our study, we examine market reaction to their M&A deals. We consider acquirer returns using CARs calculated over five-day event windows (-2, +2)⁹ around the

⁹ Our results are robust (not reported) for 3-day window (-1,1).

acquisition announcement date (see, Masulis et al. (2007), Fuller, Netter and Stegemoller (2002)). We control for deal specific features following Hardford, Humphrey-Jenner and Powell (2012). The results show that the announcement returns for firms with powerful CEOs were, on average, lower (column (1))¹⁰ before the enactment of the SOX though the effect is mainly driven by *Non-compliant Firms* (column (2)) *with powerful CEOs*. However, after the enactment of SOX, these firms' announcement returns become positive and significant (column (2)). This indicates that the valuable advices and monitoring by independent boards can divert the enthusiasm powerful-CEOs to value enhancing projects or facilitate taking optimal policies without necessarily curving CEO power.

<<<<Insert Table 7 about here>>>>

We also analyses the acquisitiveness of the powerful CEOs by counting the number of acquisitions per firm-year (acquisition count). Consistent with previous literature^{11,12}, we find that *Non-Compliant firms* with powerful CEOs, not being properly monitored by empowered board made frequent acquisitions. However, the acquisitiveness of *Non-compliant Firms* with powerful CEOs declines after the enactment of the SOX.

4.3. Powerful CEOs, dividend payout policy and financing choice:

In this section, we examine the impact of powerful CEOs on dividend payout policy, and leverage. The results for dividend payout are in columns (1) to (3) of Table 8. We show that on average, firms with powerful CEOs are associated with lower dividend payments in the pre-SOX period. However, in the post-SOX period, dividends in firms with powerful CEOs increase (the coefficient on the interaction term is positive and significant). The results show that the tendency of firms with powerful CEOs to pay lower dividends in the pre-SOX periods and the subsequent increase in dividend payments in the post-SOX period is concentrated in *Non-Compliant Firms* with powerful-CEOs (column 2).

<<<<Insert Table 8 about here>>>>

The leverage results are in columns (4) to (6). We show that firms with powerful CEOs use more debt financing. We find similar results for the pre-SOX usage of debt in both

¹⁰ Masulis et al. (2007) document lower announcement returns for dictator CEOs.

¹¹ Fracassi and Tate (2012) argue that firms with more powerful CEOs are more likely to add new directors with pre-existing network ties that results in weaker board monitoring and more frequent acquisitions, but their merger bids destroy shareholder value. The effects are concentrated in firms with weak governance.

¹² Fahlenbrach (2009), using a sample of US firms from 1993 to 2002 (pre-SOX period) shows that firms that are headed by founder-CEOs (a component of powerful CEO index) make more acquisitions per year than non-founder-CEO firms.

the *Compliant* and the *Non-Compliant Firms*. This is consistent with the view that powerful CEOs prefer to avoid dilution of stock ownership to maintain their powerful position within the firm even at the cost of increased monitoring by debt-holders. A possible explanation of the ineffective monitoring by creditors could be the overinvestment in total assets, PPE and capital expenditures by firms with powerful CEOs (see: Jensen (1986)). However, in the post SOX, the results suggest that firms with powerful CEOs use less debt. The results only hold for the *Non-Compliant Firms*.

5. Robustness tests:

5.1. Powerful CEOs, poorly governed firms and SOX:

Arguably, the mandated increase in independence of audit committees and boards in general would benefit firms which are otherwise poorly governed or have a high Entrenchment Index value (E-index) (see, Bebchuk et al. (2009)). Entrenchment provisions may harm shareholders by weakening the disciplinary threat of removal of management thereby could increase shirking, empire-building, and extraction of private benefits (see, Fracassi and Tate (2012)). Since an improvement in internal governance triggered by board and committee level independence would help to mitigate the negative effects associated with having highly entrenched management, we would expect a stronger effect of the SOX in these firms.

<<<<Insert Table 9 about here>>>>

We consider sub-samples of firms that have a high (above median) pre-SOX E-index value (highly entrenched firms) and a low (below median) pre-SOX E-index value. E-Index data are from Bebchuk et al. (2009). We find significant results for the sample of pre-SOX high E-Index firms but not for the sample of the pre-SOX low E-index firms. The high E-index sub-sample results are generally consistent with the results for the entire sample. Powerful CEOs who were entrenched in the pre-SOX period, invest significantly more in R&D, lower capital expenditures, lower PPE and asset growth, lower leverage and higher dividends in the post SOX period.

5.2. Powerful CEOs, other measures of power and omitted governance variables:

Bebchuk et al. (2011) use CEO Pay Slice (CPS) -the fraction of the aggregate compensation of the top-five executive team captured by the CEO - to measure the relative importance of the CEO and the extent to which the CEO may extract rent. They suggest that

CPS measures the centrality of the CEO in the compensation structure and reflects the outcome of CEO power on compensation. Adams et al. (2005) consider CEO power by exploring several sources of power but do not measure power in aggregate form to formulate a unique measure of CEO power. They concentrate on the title accumulation and founder status of CEOs, and whether or not the CEO is the only insider on the board. As we do not include ‘CPS’ and ‘only insider’ as a component in the CEO power measure, we control for these two variables in Table 10 in addition to the overconfidence measure. Our results continue to hold after controlling for these variables.

<<<<Insert Table 10 about here>>>>

Although we explicitly consider the underlying governance of the firms in identifying the moderating effect of the SOX on the effect of CEO power on firm-level policies, one could argue that our results, nevertheless, may be driven by other omitted characteristics of corporate governance. We argue that this, though not impossible, is less likely to be the case since we use firm-fixed effects in our specifications. Nevertheless, we control for other corporate governance features in our specifications. For example, external governance mechanisms, such as institutional holdings of company stock, may exert influence on the CEOs’ investment preferences and quality (see, Apple, Gormley and Keim (2016), Edmans (2009)). In addition, when the wedges between cash-flow rights and control rights are significantly large, a firms’ governance quality may be significantly different since some of the agents dominate the decision-making forum (Villalonga and Amit (2006)). This leaves the room adoption of more self-serving strategies (Masulis et al. (2009)). In addition, Yermack (1996) suggests that the size of the corporate board has important implications for the governance quality and firms’ outcomes.

Therefore, we control for Institutional Holdings¹³, Dual-class share structure and Board size as additional control variables to our baseline specifications. We report the results of in Table 10 and find results consistent with our baseline estimations.

5.3. Alternative econometric modelling: Industry-Year interacted joint fixed effects

We also test whether the results are robust to the use of alternative fixed effects estimation. Specifically, industry specific shocks in a particular year may jointly affect CEO power and firm-level policies. To mitigate such concern, we run the baseline specifications

¹³ Institutional holdings data are from Thomson Reuters Institutional (13f) Holdings dataset.

using (industry X year) interacted joint fixed-effects instead of the baseline year fixed-effects and industry fixed-effects or year fixed-effects and firm-fixed effects. The results in Table 11 are consistent with the baseline results suggesting that time varying industry shocks are unlikely to drive our results.

<<<<Insert Table 11 about here>>>>

5.4. CEO overconfidence and Powerful CEOs

Banarjee et al. (2015) show that in the post-SOX period, over-confident CEOs have been restrained in terms of over-investment in tangible investments such as PP&E and CAPEX. Some of the powerful CEOs in our study could also be overconfident CEOs, although the correlation coefficient between powerful CEOs and overconfident CEOs is not very high (0.078). We construct overconfidence measure following Humphery-Jenner, Lisic, Nanda and Silveri (2016). Nevertheless, to ensure that our results are not being driven by over-confident CEOs as in Banarjee et al. (2015), we test our hypotheses after excluding the firms with overconfidence measure is in the top quartile of the sample. We report the consistent results in Table 12a. We also include an overconfident-CEO variable and an interaction-term of overconfident-CEO and SOX in models (1) to (6) in Table 12b. We find robust results for the moderating effect of the SOX on the relationship between CEO power and firm-level policies.

<<<<Insert Table 12a about here>>>>

<<<<Insert Table 12b about here>>>>

6. Conclusion

We analyse whether the efforts of powerful CEOs pursuing self-serving policies (such as empire building) could be diverted by the board of directors, to be better aligned with the interests of shareholders. We use the concurrent passage of the Sarbanes-Oxley Act of 2002 (SOX) and NYSE/NASDAQ listing regulation changes as an exogenous shock to internal firm governance to explore the impact of powerful CEOs on corporate policies. In particular, we use the heterogeneity in firm governance pre SOX, to challenge the notion that powerful CEOs are detrimental for all firms.

We suggest that contrary to the popular perception of the self-serving behavior of powerful CEOs, the improvement in governance induced by exogenous regulatory changes can channel or divert the misaligned efforts of powerful CEOs to value enhancing projects. In particular, for firms that had weaker governance, the passage of SOX was more likely to

be an “exogenous shock” than for firms that were compliant with SOX before it became mandated.

The results suggest that the impact of SOX on firm corporate policy is concentrated in those firms with powerful CEOs, that were *Non-Compliant* in the pre SOX period. These firms in the pre-SOX period engage more in empire building (higher tangible investment growth), invest less in risky R&D investments, and associated with inferior innovation outcomes (patents and citations). They have lower quality investments (proxied by the market reaction to M&A announcements) but have a higher level of acquisitiveness (number of deals). In addition, they have a higher degree of financial leverage and pay lower dividends.

However, in the post-SOX period, *Non-Compliant Firms* with powerful CEOs engage in less empire building (pursue lower growth in CAPEX, PP&E and total assets), make higher quality investments (positive announcement return on M&A deals) but fewer acquisitions. They invest more in R&D investments and the increase in R&D investment significantly increases corporate innovation productivity.

We also find evidence of value creation in the post-SOX period, in that *Non-Compliant Firms* with powerful CEOs introduce higher quality new products. In addition, they pay more dividends, and have lower leverage in the post-SOX period. The results are robust to the inclusion of other measures of CEO power used in the literature (CEO Pay Slice, CEO being only insider in the board and CEO overconfidence). Overall, the results suggest that improved decision making in the post-SOX period benefited the firms that needed such an exogenous change in governance to discipline powerful CEOs- firms with weak corporate governance structures.

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Table 1: Summary statistics

This table provides summary statistics for data employed in the analysis. The sample consists of 1,102 publicly traded, non-regulated firms that were available on ExecuComp from 1992 to 2014. The sample excludes missing data on CEO power components and firms that experience CEO turnover around SOX in 2002. 'Founder-CEO' in a given year is an indicator variable that equals one if any source explicitly mentions that the current CEO is one of the original founders of the firm or was a main executive at the time the company was founded. 'CEO-Chair' is an indicator of powerful-CEO and it equals one if CEO is also the chairman of the board. 'CEO title concentration', is a dummy variable which is one if CEOs hold more than two titles and zero otherwise. The percentage of ownership held by CEOs is represented by 'CEO Ownership'. 'CEO Ownership above industry median' is an indicator equals one if the ownership of CEOs is greater than industry median. 'CEO Tenure' is the number of years the CEO has served as CEO at the firm. 'CEO Tenure above industry median' is one if the tenure of CEO is above the industry median. 'CEO Power' is an index which is an aggregate measure of the five components of CEO power and thus the index value ranges from 0 to 5. 'CEO Power TOP-Q' is one if 'CEO Power' index is in the top quartile of the industry. 'Market Cap' is firm market capitalization measured by share price times shares outstanding at the fiscal year-end. 'Profitability' is earnings before interest and tax (EBIT) scaled by total assets. 'R&D/Asset' is R&D expenditures scaled by total assets. 'CAPEX/Asset' is capital expenditures scaled by total assets. 'Leverage' is long term debt over total assets. 'Cash/Asset' is cash scaled by total assets. 'Asset growth' represents the log increase in assets from concurrent year to previous year. 'PPE growth' represents the log increase in PPE form concurrent year to next year. 'Tobin's Q' is Market value of assets over book value of assets. 'Patent_(t+1)' is natural logarithm of one plus number of patents in year (t+1). 'Citations_(t+1)' is natural logarithm of one plus number of citations in year (t+1). P-values are in parentheses. Significance levels are indicated: *=10%; **=5%; ***=1%.

Panel A: CEO Power components and variables						
Variable	Mean	25th Percentile	Median	75th Percentile	Standard deviation	
Founder CEO	0.18	0.00	0.00	0.00	0.38	
CEO-Chair duality	0.60	0.00	1.00	1.00	0.49	
Title Concentration	0.25	0.00	0.00	1.00	0.44	
CEO Ownership	0.03	0.00	0.00	0.02	0.06	
CEO Ownership above industry median	0.47	0.00	0.00	1.00	0.50	
CEO Tenure	8.86	3.00	6.00	12.00	7.96	
CEO Tenure above industry median	0.50	0.00	0.00	1.00	0.50	
CEO Power	2.02	1.00	2.00	3.00	1.40	
CEO Power Top Q	0.16	0.00	0.00	0.00	0.37	

Panel B: Correlation matrix of CEO Power components and variables							
Variable	Founder CEO	CEO-Chair duality	Title Concentration	CEO Ownership	CEO Tenure	CEO Power	CEO Power Top Q
Founder CEO	1						
CEO-Chair duality	0.13	1					
Title Concentration	0.02	0.47	1				
CEO Ownership	0.45	0.14	0.04	1			
CEO Tenure	0.48	0.25	0.07	0.41	1		
CEO Power	0.55	0.66	0.52	0.42	0.62	1	
CEO Power Top Q	0.53	0.35	0.40	0.37	0.46	0.69	1

Panel C: Summary statistics of full sample						
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Variable	Mean	25th Percentile	Median	75th Percentile	Standard deviation
Market Cap (\$million)	6864.97	500.46	1297.84	4177.69	24875.05
Profitability	0.09	0.05	0.10	0.15	0.28
R&D/Asset	0.04	0.00	0.00	0.04	0.14
CAPEX/Asset	0.06	0.02	0.04	0.07	0.06
Leverage	0.19	0.02	0.16	0.29	0.19
Dividend/Asset	0.01	0.00	0.00	0.02	0.04
Cash/asset	0.11	0.02	0.07	0.15	0.12
Assert growth	0.09	-0.02	0.06	0.16	0.28
PPE Growth	0.07	-0.04	0.04	0.15	0.30
Tobin's Q	2.17	1.25	1.66	2.38	2.56
Patents (t+1)	1.08	0.00	0.00	1.95	1.58
Citations (t+1)	1.60	0.00	0.00	3.14	2.37

Panel D: Summary statistics of powerful CEO sample

Variable	Mean	25th Percentile	Median	75th Percentile	Standard deviation	P-Value
Market Cap (\$million)	3749.22	469.33	1034.69	2411.28	17207.29	0.00***
Profitability	0.09	0.06	0.10	0.15	0.26	0.42
R&D/Asset	0.04	0.00	0.00	0.05	0.17	0.24
CAPEX/Asset	0.06	0.02	0.04	0.08	0.07	0.00***
Leverage	0.17	0.00	0.13	0.28	0.17	0.00***
Dividend/Asset	0.01	0.00	0.00	0.01	0.03	0.00***
Cash/asset	0.12	0.03	0.08	0.17	0.13	0.00***
Assert growth	0.11	0.00	0.08	0.19	0.26	0.00***
PPE Growth	0.09	-0.03	0.06	0.19	0.31	0.00***
Tobin's Q	2.35	1.30	1.76	2.68	2.14	0.00***
Patents (t+1)	0.92	0.00	0.00	1.61	1.44	0.00***
Citations (t+1)	1.45	0.00	0.00	2.71	2.32	0.00***

Table 2: Powerful CEOs and R&D investment

This table represents results for the relationship between firm R&D investment and powerful CEOs. Columns (1), (2), (5), (6) include all S&P1500 firms from 1992-2014 with available information to construct powerful-CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. Data for compliant and non-compliant S&P1500 firms are from IRRC. We define 'Compliant firms' (columns (4) and (8)) are firms with both a majority independent board and fully independent audit committee before SOX (1998-2001) and others as 'Non-compliant firms' (columns (3) and (7)). The dependent variable is R&D expenditures_(t+1) scaled by total assets_(t). 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'CEO power Top Q' is an indicator variable equals one if the value of CEO Power is in the top quartile of the industry. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Firm size' is measured by market value of equity. 'Asset growth' represents the log increase in assets from concurrent year to previous year. 'Profitability' is firms' earnings before interest and tax (EBIT) scaled by total assets. 'CAPEX/Asset' is firms' capital expenditures scaled by total assets. 'R&D/Asset' is firms' value of R&D expenditures scaled by total assets. 'Leverage' is long term debt by asset. 'Tobin's Q' is market value of assets over book value of assets. All models include year fixed effect. Models (1) and (5) include industry fixed effects. The other models include firm fixed effects. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	[RD(t+1)/Asset(t)] x 100							
	Full sample		Non-compliant	Compliant	Full sample		Non-compliant	Compliant
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SOX * CEO Power	0.063** [0.032]	0.143*** [0.000]	0.159*** [0.002]	0.079 [0.256]				
SOX * CEO power Top Q					0.114 [0.308]	0.338*** [0.005]	0.422*** [0.005]	0.241 [0.408]
CEO Power	-0.111*** [0.000]	-0.144*** [0.000]	-0.135*** [0.000]	-0.138* [0.061]				
CEO power Top Q					-0.257** [0.011]	-0.313** [0.022]	-0.247* [0.061]	-0.348 [0.283]
SOX	0.146 [0.387]	0.568*** [0.004]	0.869*** [0.001]	0.583 [0.131]	0.276* [0.092]	0.826*** [0.000]	1.146*** [0.000]	0.739** [0.039]
Firm size	-0.144*** [0.000]	-0.573*** [0.000]	-0.536*** [0.000]	-0.787*** [0.000]	-0.143*** [0.000]	-0.573*** [0.000]	-0.538*** [0.000]	-0.788*** [0.000]
Asset growth	1.579*** [0.000]	2.265*** [0.000]	2.111*** [0.000]	2.998*** [0.000]	1.566*** [0.000]	2.259*** [0.000]	2.107*** [0.000]	2.986*** [0.000]
Profitability	0.213 [0.741]	0.781** [0.034]	-0.158 [0.750]	-1.561 [0.133]	0.211 [0.742]	0.779** [0.034]	-0.158 [0.747]	-1.536 [0.142]
CAPEX/Asset	-0.681 [0.147]	0.827 [0.245]	1.328 [0.292]	0.572 [0.592]	-0.683 [0.146]	0.807 [0.259]	1.264 [0.321]	0.554 [0.607]

R&D/Asset	82.279*** [0.000]	42.089*** [0.000]	41.999*** [0.000]	41.318*** [0.000]	82.329*** [0.000]	42.134*** [0.000]	42.067*** [0.000]	41.355*** [0.000]
Leverage	-0.451** [0.021]	-0.668** [0.032]	-0.525 [0.128]	-1.324* [0.066]	-0.456** [0.019]	-0.687** [0.027]	-0.532 [0.114]	-1.346* [0.062]
Tobin's Q	0.141*** [0.000]	0.363*** [0.000]	0.385*** [0.000]	0.451*** [0.000]	0.140*** [0.000]	0.361*** [0.000]	0.385*** [0.000]	0.449*** [0.000]
Constant	0.957*** [0.000]	5.306*** [0.000]	4.466*** [0.000]	7.735*** [0.000]	0.761*** [0.002]	5.051*** [0.000]	4.226*** [0.000]	7.513*** [0.000]
Year fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Firm fixed effect	N	Y	Y	Y	N	Y	Y	Y
Industry fixed effect	Y	N	N	N	Y	N	N	N
Observations	18,263	18,263	8,604	5,338	18,263	18,263	8,604	5,338
R-squared	0.843	0.339	0.347	0.376	0.842	0.338	0.346	0.376

Table 3a: Powerful CEOs, innovation output and quality of innovation

This table represents results for examining the relationship between firm's innovation and powerful CEOs. Columns (1) and (4) include all S&P1500 firms from 1992-2008 with available information on innovation from Kogan et al. (2012) and to construct powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. Data for compliant and non-compliant S&P1500 firms are from IRRC. We define 'Compliant Firms' (columns (3) and (6)) are firms with both a majority independent board and fully independent audit committee before SOX (1998-2001) and others as 'Non-Compliant Firms' (columns (2) and (5)). The dependent variable in models (1) to (3) is $\log(1+\text{number of patents})_{(t+2)}$. The dependent variable in models (4) to (6) is $\log(1+\text{number of citations})_{(t+2)}$. 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'CEO power Top Q' is an indicator variable equals one if the value of CEO Power is in the top quartile of the industry. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Firm size' is measured by market value of equity. 'Asset growth' represents the log increase in assets from concurrent year to previous year. 'Profitability' is firms' earnings before interest and tax (EBIT) scaled by total assets. 'CAPEX/Asset' is firms' capital expenditures scaled by total assets. 'R&D/Asset' is firms' value of R&D expenditures scaled by total assets. 'Leverage' is long term debt by asset. 'Tobin's Q' is market value of assets over book value of assets. All models include firm and year fixed effects. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	Patent $_{(t+2)}$			Citations $_{(t+2)}$		
	All firms	Non-compliant	Compliant	All firms	Non-compliant	Compliant
Model	(1)	(2)	(3)	(4)	(5)	(6)
SOX * CEO Power	0.044***	0.055**	0.048**	0.094***	0.156***	0.093*
	[0.005]	[0.033]	[0.040]	[0.003]	[0.002]	[0.061]
CEO Power	-0.029**	-0.044**	-0.026	-0.052*	-0.088**	-0.050
	[0.018]	[0.011]	[0.220]	[0.050]	[0.017]	[0.266]
SOX	-1.408***	-1.564***	-1.541***	-2.725***	-3.028***	-2.963***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Firm size	0.092***	0.094**	0.123***	0.063	0.076	0.120
	[0.001]	[0.024]	[0.009]	[0.207]	[0.322]	[0.151]
Asset growth	-0.146***	-0.175***	-0.162**	-0.212***	-0.207*	-0.270**
	[0.000]	[0.007]	[0.027]	[0.003]	[0.051]	[0.044]
Profitability	-0.544**	-0.627*	-0.762***	-0.400	-0.513	-0.863*
	[0.019]	[0.092]	[0.004]	[0.300]	[0.406]	[0.066]
CAPEX/Asset	0.082	-0.249	0.385	0.446	-0.410	1.178
	[0.741]	[0.488]	[0.386]	[0.402]	[0.591]	[0.251]
R&D/Asset	1.551***	0.884	2.344***	5.079***	5.257***	5.340***
	[0.000]	[0.166]	[0.001]	[0.000]	[0.000]	[0.000]
Leverage	-0.148	-0.341**	0.018	-0.393*	-0.707**	0.066
	[0.281]	[0.035]	[0.921]	[0.090]	[0.011]	[0.841]
Tobin's Q	0.025	0.017	0.033	0.061**	0.031	0.096**
	[0.108]	[0.509]	[0.142]	[0.041]	[0.518]	[0.030]

Constant	0.650*** [0.000]	0.878*** [0.002]	0.453 [0.128]	1.938*** [0.000]	2.252*** [0.000]	1.608*** [0.003]
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	10,357	5,376	3,348	10,357	5,376	3,348
R-squared	0.281	0.277	0.331	0.354	0.358	0.397

Table 3b: Powerful CEO, innovation output and quality of innovation

Dependent variable	Patent _(t+2)			Citations _(t+2)		
	All firms (1)	Non-compliant (2)	Compliant (3)	All firms (4)	Non-compliant (5)	Compliant (6)
SOX *CEO power Top Q	0.226*** [0.000]	0.331*** [0.000]	0.190** [0.012]	0.383*** [0.001]	0.599*** [0.001]	0.400** [0.033]
CEO power Top Q	-0.069 [0.152]	-0.104* [0.096]	-0.114 [0.225]	-0.093 [0.372]	-0.148* [0.098]	-0.244 [0.208]
SOX	-1.344*** [0.000]	-1.370*** [0.000]	-1.473*** [0.000]	-2.580*** [0.000]	-2.780*** [0.000]	-2.833*** [0.000]
Firm size	0.089*** [0.001]	0.113*** [0.006]	0.124*** [0.009]	0.060 [0.224]	0.069 [0.365]	0.121 [0.151]
Asset growth	-0.538** [0.021]	-0.359 [0.214]	-0.762*** [0.005]	-0.391 [0.314]	-0.479 [0.438]	-0.863* [0.068]
Profitability	0.072 [0.770]	-0.649* [0.077]	0.415 [0.342]	0.428 [0.416]	-0.537 [0.483]	1.244 [0.215]
CAPEX/Asset	-0.140 [0.316]	-0.376** [0.012]	0.021 [0.907]	-0.378 [0.108]	-0.676** [0.018]	0.074 [0.822]
R&D/Asset	0.027* [0.091]	0.003 [0.919]	0.034 [0.132]	0.063** [0.035]	0.033 [0.489]	0.098** [0.025]
Leverage	-0.146*** [0.000]	-0.126** [0.024]	-0.158** [0.031]	-0.213*** [0.003]	-0.209** [0.048]	-0.262* [0.053]
Tobin's Q	1.572*** [0.000]	0.768 [0.164]	2.345*** [0.001]	5.112*** [0.000]	5.257*** [0.000]	5.345*** [0.000]
Constant	0.606*** [0.001]	0.764*** [0.005]	0.402 [0.172]	1.841*** [0.000]	2.118*** [0.000]	1.518*** [0.004]
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	10,357	5,376	3,348	10,357	5,376	3,348
R-squared	0.282	0.279	0.331	0.355	0.358	0.398

Table 4: Powerful CEO, SOX and Value of R&D investments

This table represents results for examining the relationship between firm's value of R&D investment and powerful CEOs. Columns (1) and (4) include all S&P1500 firms from 1992-2008 with available information on innovation from Kogan et al. (2012) and to construct powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. Data for compliant and non-compliant S&P1500 firms are from IRRC. We define 'Compliant Firms' (columns (3) and (6)) are firms with both a majority independent board and fully independent audit committee before SOX (1998-2001) and others as 'Non-Compliant Firms' (columns (2) and (5)). The dependent variable in models is $\log(1+\text{number of patents})_{(t+2)}$. 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'CEO power Top Q' is an indicator variable equals one if the value of CEO Power is in the top quartile of the industry. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Firm size' is measured by market value of equity. 'Asset growth' represents the log increase in assets from concurrent year to previous year. 'Profitability' is firms' earnings before interest and tax (EBIT) scaled by total assets. 'CAPEX/Asset' is firms' capital expenditures scaled by total assets. 'R&D/Asset' is firms' value of R&D expenditures scaled by total assets. 'Leverage' is long term debt by asset. 'Tobin's Q' is market value of assets over book value of assets. All models include firm and year fixed effects. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	Patent _(t+2)					
	All firms	Non-compliant	Compliant	All firms	Non-compliant	Compliant
Model	(1)	(2)	(3)	(4)	(5)	(6)
SOX * CEO Power* R&D	0.655** [0.044]	1.277** [0.013]	0.774** [0.045]			
SOX *CEO power Top Q * R&D				2.155** [0.031]	4.203*** [0.003]	1.154 [0.431]
SOX * R&D	-4.530*** [0.000]	-7.474*** [0.000]	-4.576*** [0.000]	-3.623*** [0.000]	-5.585*** [0.000]	-3.299*** [0.000]
CEO Power * R&D	-0.083 [0.726]	-0.245 [0.417]	-0.215 [0.541]			
CEO power Top Q * R&D				0.308 [0.757]	-0.136 [0.884]	-0.655 [0.778]
SOX * CEO Power	0.015 [0.390]	-0.007 [0.769]	0.014 [0.597]			
SOX *CEO power Top Q				0.162*** [0.002]	0.159** [0.033]	0.194** [0.029]
CEO Power	-0.025** [0.043]	-0.028* [0.062]	-0.013 [0.535]			
CEO power Top Q				-0.091* [0.060]	-0.074 [0.189]	-0.113 [0.253]
SOX	-1.260*** [0.000]	-1.281*** [0.000]	-1.886*** [0.000]	-1.243*** [0.000]	-1.309*** [0.000]	-1.458*** [0.000]

Firm size	0.099*** [0.000]	0.121*** [0.001]	0.110** [0.034]	0.097*** [0.000]	0.120*** [0.001]	0.111** [0.034]
Asset growth	-0.127*** [0.002]	-0.162** [0.011]	-0.140* [0.083]	-0.124*** [0.003]	-0.160** [0.014]	-0.131 [0.114]
Profitability	-0.608*** [0.001]	-0.727*** [0.003]	-0.492* [0.066]	-0.630*** [0.000]	-0.800*** [0.001]	-0.761*** [0.005]
CAPX/Asset	0.040 [0.866]	-0.410 [0.206]	0.682 [0.164]	0.046 [0.844]	-0.428 [0.191]	0.527 [0.259]
R&D/Asset	1.971*** [0.006]	3.473** [0.011]	1.978** [0.018]	1.724*** [0.001]	3.164*** [0.002]	1.202** [0.048]
Leverage	-0.074 [0.469]	-0.108 [0.341]	-0.060 [0.740]	-0.062 [0.562]	-0.099 [0.432]	-0.040 [0.826]
Tobin's Q	0.023 [0.128]	0.004 [0.846]	0.043* [0.080]	0.026* [0.085]	0.006 [0.785]	0.039 [0.102]
Constant	0.605*** [0.001]	0.557** [0.022]	-0.244 [0.615]	0.569*** [0.001]	0.512** [0.033]	0.649* [0.052]
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	10,357	5,376	3,348	10,357	5,376	3,348
R-squared	0.296	0.302	0.342	0.297	0.305	0.339

Table 5: Powerful CEO, innovation and value creation

This table represents results for examining the relationship between firm's innovation and value creation through product announcement in the post-SOX period. Columns (1) and (4) include all S&P1500 firms from 1992-2006 with available data on the market reaction to a new product announcement from Mukherjee et al. (2017), on innovation from Kogan et al. (2012), and to construct powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. Data for compliant and non-compliant S&P1500 firms are from IRR. We define 'Compliant Firms' (columns (3) and (6)) are firms with both a majority independent board and fully independent audit committee before SOX (1998-2001) and others as 'Non-Compliant Firms' (columns (2) and (5)). The dependent variable in models (1) to (3) is 'ann_cum'-the sum of all positive cumulative abnormal returns over the year. Models (3) to (6) include the count of the number of announcements with the cumulative abnormal returns above the 75 percentile, represented by 'ann_75'. 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Firm size' is measured by market value of equity. 'Sales growth' represents the log increase in assets from concurrent year to previous year. 'Profitability' is firms' earnings before interest and tax (EBIT) scaled by total assets. 'CAPEX/Asset' is firms' capital expenditures scaled by total assets. 'R&D/Asset' is firms' value of R&D expenditures scaled by total assets. 'Leverage' is long term debt by asset. 'Tobin's Q' is market value of assets over book value of assets. 'Patent (t)' is $\log(1+\text{number of patents})_{(t)}$. All models include firm and year fixed effects. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	ann_75			ann_cum		
	All firms	Non-compliant	Compliant	All firms	Non-compliant	Compliant
Model	(1)	(2)	(3)	(4)	(5)	(6)
SOX * CEO Power	0.226** [0.012]	0.227*** [0.008]	0.223 [0.319]	0.015** [0.033]	0.015** [0.049]	0.017 [0.269]
CEO Power	-0.111 [0.212]	-0.111* [0.058]	-0.113 [0.647]	-0.009 [0.199]	-0.011* [0.067]	-0.007 [0.715]
SOX	1.609** [0.030]	0.594 [0.473]	3.486* [0.071]	0.117** [0.031]	0.104 [0.130]	0.230* [0.097]
Firm size	0.267 [0.126]	0.289 [0.236]	0.451 [0.115]	0.015 [0.277]	0.011 [0.538]	0.028 [0.207]
Sales growth	-0.522** [0.041]	-0.377** [0.024]	-1.270 [0.164]	-0.035* [0.083]	-0.025* [0.076]	-0.113 [0.185]
Profitability	-1.031 [0.276]	-3.258** [0.024]	0.248 [0.899]	-0.154** [0.039]	-0.243*** [0.005]	-0.011 [0.942]
CAPX/Asset	-7.662** [0.022]	-3.818 [0.285]	-12.655* [0.066]	-0.613** [0.020]	-0.428 [0.162]	-0.939* [0.082]
R&D/Asset	1.816 [0.328]	7.245** [0.036]	0.356 [0.817]	0.021 [0.898]	0.299 [0.406]	-0.045 [0.723]

Leverage	-1.310** [0.022]	-1.265 [0.178]	-1.965** [0.050]	-0.087* [0.098]	-0.067 [0.490]	-0.138* [0.080]
Tobin's Q	0.120*** [0.003]	0.143*** [0.000]	0.110 [0.417]	0.013*** [0.002]	0.015*** [0.000]	0.012 [0.392]
Patents(t)	0.256 [0.252]	-0.039 [0.754]	0.672 [0.133]	0.012 [0.471]	-0.005 [0.536]	0.048 [0.173]
Constant	-2.700 [0.104]	-1.890 [0.230]	-5.376* [0.072]	-0.136 [0.290]	-0.037 [0.757]	-0.309 [0.135]
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	2,601	1,375	936	2,601	1,375	936
R-squared	0.150	0.171	0.197	0.168	0.208	0.195

Table 6: Powerful CEO, empire building investments in tangible assets and SOX

This table represents results of the analyses of the empire building strategy of Powerful CEOs. Columns (1), (4), (7) include all S&P1500 firms from 1992-2014 with available information to construct powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. 'Compliant Firms' (columns (3), (6) and (9)) are firms with both majority independent board and fully independent audit committee before the SOX (1998-2001) and others are 'Non-Compliant Firms' (columns (2), (5) and (8)). The dependent variable in models (1) to (3) include $\log[\text{Capital Expenditures}(t+1)/ \text{Capital Expenditures}(t)]$. The dependent variable in models (4) to (6) include $\log[\text{Property, plant and equipment}(t+1)/ \text{Property, plant and equipment}(t)]$. The dependent variable in models (7) to (9) include $\log[\text{Asset}(t+1)/ \text{Asset}(t)]$. 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Firm size' is market value of equity. 'Profitability' is firms' earnings before interest and tax (EBIT) scaled by total assets. 'Cash/Asset' is firms' cash flow scaled by total assets. 'R&D/Asset' is firms' value of R&D expenditures by total assets. 'Leverage' is long term debt by asset. 'Tobin's Q' is market value of assets over book value of assets. All models include firm and year fixed effects. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	CAPX Growth			PP&E Growth			Asset growth		
	All firms	Non-compliant	Compliant	All firms	Non-compliant	Compliant	All firms	Non-compliant	Compliant
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SOX * CEO Power	-0.015*** [0.007]	-0.015** [0.047]	-0.013 [0.196]	-0.011*** [0.001]	-0.009** [0.050]	-0.006 [0.205]	-0.008*** [0.004]	-0.010** [0.049]	-0.007 [0.119]
CEO Power	0.008 [0.114]	0.011* [0.097]	-0.006 [0.513]	0.012*** [0.000]	0.010*** [0.010]	0.003 [0.420]	0.010*** [0.000]	0.008** [0.026]	0.010** [0.012]
SOX	-0.241*** [0.000]	-0.223*** [0.000]	-0.169*** [0.005]	-0.140*** [0.000]	-0.134*** [0.000]	-0.093*** [0.000]	-0.095*** [0.000]	-0.082*** [0.000]	-0.089*** [0.001]
Firm size	0.026*** [0.000]	0.008 [0.384]	-0.015 [0.194]	0.010** [0.014]	0.006 [0.307]	-0.003 [0.619]	-0.006* [0.077]	-0.000 [0.993]	-0.015*** [0.010]
Profitability	0.385*** [0.000]	0.616*** [0.000]	0.654*** [0.000]	0.443*** [0.000]	0.415*** [0.000]	0.403*** [0.000]	0.415*** [0.000]	0.316*** [0.001]	0.550*** [0.000]
Cash/Asset	0.636*** [0.000]	0.637*** [0.000]	0.643*** [0.000]	0.335*** [0.000]	0.350*** [0.000]	0.282*** [0.000]	0.162*** [0.000]	0.164** [0.020]	0.144*** [0.001]
R&D/Asset	0.659*** [0.000]	-0.402* [0.058]	-0.428* [0.059]	-0.020 [0.838]	-0.315** [0.046]	-0.231** [0.047]	0.799*** [0.000]	0.866*** [0.000]	0.646*** [0.000]
Leverage	-0.123*** [0.000]	-0.037 [0.524]	-0.118* [0.062]	-0.117*** [0.000]	-0.094** [0.048]	-0.107*** [0.004]	-0.130*** [0.000]	-0.077 [0.235]	-0.149*** [0.000]

Tobin's Q	0.027*** [0.000]	0.029*** [0.000]	0.078*** [0.000]	0.021*** [0.000]	0.020*** [0.000]	0.034*** [0.000]	0.021*** [0.000]	0.009 [0.892]	0.019*** [0.000]
Constant	-0.160*** [0.001]	-0.032 [0.635]	-0.055 [0.560]	-0.045 [0.130]	-0.004 [0.905]	-0.062 [0.241]	0.052** [0.033]	0.004 [0.946]	0.072* [0.099]
Year fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	17,844	8,411	5,233	17,999	8,507	5,258	18,054	8,517	5,271
R-squared	0.102	0.110	0.136	0.182	0.187	0.224	0.172	0.151	0.228

Table 7: Powerful CEO, M&A deals and SOX

This table represents results of the analyses of M&A deals of Powerful CEOs. Columns (1) include all S&P1500 firms from 1992-2012 with available information to construct powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. 'Compliant Firms' (columns (3), (6) and (9)) are firms with both majority independent board and fully independent audit committee before the SOX (1998-2001) and others are 'Non-Compliant Firms' (columns (2), (5) and (8)). The dependent variable in models (1) to (3) is CAR which is five-day cumulative abnormal return calculated using the market model. The dependent variable in models (4) and (5) include acquisition count- the number of acquisitions per firm per year. CRSP's daily value weighted return is used as market model for calculating market specific parameters. 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Firm size' is market value of equity. 'Profitability' is firms' earnings before interest and tax (EBIT) scaled by total assets. 'Cash/Asset' is firms' cash flow scaled by total assets. 'R&D/Asset' is firms' value of R&D expenditures by total assets. 'Leverage' is long term debt by asset. 'Tobin's Q' is market value of assets over book value of assets. 'Relative deal size' is transaction value over acquirer's market capitalization on 11 day before the announcement date. 'Public target' is one if the target company is a public company, otherwise zero. 'Private target' is one if the target company is a private company, otherwise zero. 'Subsidiary target' is one if the target company is a subsidiary company, otherwise zero. 'Cross boarder deal' is one if the target company is a foreign company, otherwise zero. 'Serial bidder' is one if the acquirer makes at least 3 deals in a year, otherwise zero. All models include year fixed effects. Models (1) to (3) include firm fixed effects. Models (4) and (5) are pooled time-series Poisson regressions. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	CAR(-2,2)			Acquisition count	
	Full sample	Non-compliant	Compliant	Non-compliant	Compliant
Model	(1)	(2)	(3)	(4)	(5)
SOX * CEO Power	0.002 [0.316]	0.006** [0.014]	0.001 [0.645]	-0.077** [0.013]	0.045 [0.192]
CEO Power	-0.003* [0.084]	-0.005** [0.036]	-0.002 [0.530]	0.032* [0.097]	-0.013 [0.653]
SOX	-0.020* [0.077]	-0.037*** [0.009]	-0.001 [0.938]	-0.476** [0.017]	-0.105 [0.739]
Firm size	0.003 [0.224]	0.007* [0.058]	-0.003 [0.513]	0.113*** [0.003]	0.149*** [0.003]
Profitability	0.013 [0.589]	-0.017 [0.625]	0.051 [0.140]	0.511 [0.176]	-0.906*** [0.010]
Cash/Asset	0.011 [0.598]	0.005 [0.897]	-0.012 [0.665]	0.599** [0.048]	0.109 [0.731]
R&D/Asset	0.057 [0.224]	0.038 [0.599]	0.024 [0.725]	0.277 [0.680]	-0.075 [0.914]
Leverage	0.045*** [0.001]	0.026 [0.191]	0.033 [0.129]	-0.090 [0.696]	0.006 [0.980]

Tobin's Q	0.003*** [0.008]	0.002 [0.311]	0.005*** [0.001]	0.006 [0.185]	-0.024* [0.067]
Relative deal size	0.001 [0.950]	-0.003 [0.765]	-0.020 [0.228]	-0.186* [0.093]	-0.288* [0.085]
Public target	0.047* [0.059]	0.027*** [0.001]	0.028 [0.604]	-0.045 [0.842]	0.386 [0.465]
Private target	0.064*** [0.010]	0.047*** [0.000]	0.043 [0.432]	-0.008 [0.970]	0.469 [0.372]
Subsidiary target	0.064*** [0.010]	0.042*** [0.000]	0.045 [0.406]	-0.035 [0.877]	0.431 [0.412]
Cross boarder deal	0.001 [0.790]	-0.000 [0.995]	0.001 [0.871]	0.008 [0.850]	-0.011 [0.843]
Serial bidder	0.002 [0.560]	0.005 [0.186]	-0.002 [0.688]		
Constant	-0.029 [0.437]	0.050 [0.179]	-0.050 [0.492]		
Year fixed effect	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	N	N
Observations	4,397	2,396	1,463	2,140	1,359
R-squared	0.025	0.036	0.049		

Table 8: Powerful CEOs, dividend policy, and financing choice

This table represents results for examining the impact of powerful CEOs on firm's dividend policy, and financing choice. Columns (1), (4), (7) include all S&P1500 firms from 1992-2014 with available information to construct powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. 'Compliant Firms' (columns (3), (6)) are firms with both majority independent board and fully independent audit committee before the SOX (1998-2001) and others are 'Non-Compliant Firms' (columns (2), (5)). The dependent variable in models (1) to (3) is 'dividend payout ratio' measured by dividend scaled by total assets in period (t+1). The dependent variable in models (4) to (6) is 'leverage' in period (t+1). 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Firm size' is measured by market value of equity. 'Profitability' is firms' earnings before interest and tax (EBIT) scaled by total assets. 'Cash/Asset' is firms' cash divided by assets. 'CAPEX/Asset' is firms' capital expenditures scaled by total assets. 'R&D/Asset' is firms' value of R&D expenditures scaled by total assets. 'Leverage' is long term debt by asset in period t. 'Tobin's Q' is market value of assets over book value of assets. All models include firm and year fixed effects. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	Dividend payout ratio _(t+1)			Leverage _(t+1)		
	All firms	Non-compliant	Compliant	All firms	Non-compliant	Compliant
	(1)	(2)	(3)	(4)	(5)	(6)
SOX * CEO Power	0.136*** [0.000]	0.111** [0.031]	0.132 [0.117]	-0.002 [0.111]	-0.007** [0.049]	-0.002 [0.327]
CEO Power	-0.110*** [0.000]	-0.085** [0.035]	-0.057 [0.546]	0.005*** [0.000]	0.005* [0.099]	0.005*** [0.003]
SOX	-0.287** [0.028]	-0.009 [0.968]	-0.061 [0.890]	0.055*** [0.000]	0.035* [0.085]	0.062*** [0.000]
Firm size	0.194*** [0.000]	0.213*** [0.000]	0.265*** [0.000]	-0.003 [0.103]	-0.005 [0.132]	-0.009** [0.040]
Profitability	0.515** [0.015]	0.223 [0.147]	0.513 [0.424]	-0.018 [0.462]	0.015 [0.735]	0.011 [0.878]
Cash/Asset	0.583*** [0.009]	0.874* [0.068]	0.624 [0.275]	-0.030*** [0.006]	-0.042* [0.067]	-0.015 [0.365]
CAPX/Asset	-1.358*** [0.007]	-1.676** [0.021]	-0.343 [0.756]	0.049* [0.054]	0.056 [0.213]	0.030 [0.347]
R&D/Asset	1.066** [0.010]	1.348** [0.027]	1.666** [0.045]	-0.040 [0.357]	0.009 [0.882]	-0.126** [0.011]
Leverage	-0.304 [0.129]	-0.226 [0.462]	-0.232 [0.633]	0.538*** [0.000]	0.504*** [0.000]	0.525*** [0.000]

Tobin's Q	-0.003 [0.672]	0.021 [0.167]	0.014 [0.152]	-0.001 [0.258]	-0.003** [0.034]	-0.001 [0.491]
Constant	0.496*** [0.008]	0.351 [0.538]	-0.779 [0.435]	0.085*** [0.000]	0.031 [0.591]	0.124*** [0.000]
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	18,033	8,509	5,262	17,325	8,187	5,070
R-squared	0.067	0.073	0.095	0.410	0.410	0.468

Table 9: Robustness test using E-index to measure quality of governance

This table represents results of robustness test of our hypothesis using E-index. The analysis includes all S&P1500 firms from 1992-2014 with available information to construct E-index from Bebchuk et al. (2009), powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. Columns (1), (3), (5), (7) (9) and (11) represent the firms with powerful CEOs having E-index value above median (>2) in pre-SOX period. The dependent variable in models (1) to (2) include $RD_{(t+1)} / R\&D_{(t)}$. The dependent variable in models (3) to (4) is $\log [\text{Capital Expenditures}_{(t+1)} / \text{Capital Expenditures}_{(t)}]$. The dependent variable in models (5) to (6) is $\log \text{Property, plant and equipment}_{(t+1)} / \text{Property, plant and equipment}_{(t)}$. The dependent variable in models (7) to (8) is dividend scaled by total assets in period (t+1). The dependent variable in models (9) to (10) is leverage in period (t+1). 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. All models include firm and year fixed effects. All control variables are from baseline regressions. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels: *=10%; **=5%; ***=1%.

Dependent variable	RD(t+1)/Asset(t)		CAPEX Growth		PPE Growth		Asset Growth		Dividend _(t+1)		Leverage _(t+1)	
	E-Index>2	E-Index<=2	E-Index>2	E-Index<=2	E-Index>2	E-Index<=2	E-Index>2	E-Index<=2	E-Index>2	E-Index<=2	E-Index>2	E-Index<=2
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SOX * CEO Power	0.148*** [0.000]	0.082 [0.349]	-0.022*** [0.005]	-0.011 [0.166]	-0.012*** [0.009]	-0.007 [0.116]	-0.010** [0.033]	-0.005 [0.313]	0.128*** [0.002]	0.071 [0.327]	-0.008** [0.015]	-0.002 [0.528]
CEO Power	-0.150*** [0.001]	-0.082 [0.275]	0.016** [0.026]	-0.000 [0.954]	0.014*** [0.000]	0.005 [0.242]	0.008** [0.025]	0.008* [0.076]	-0.099*** [0.003]	-0.070 [0.261]	0.010*** [0.001]	0.006* [0.074]
SOX	0.277 [0.203]	1.175*** [0.004]	-0.245*** [0.000]	-0.219*** [0.000]	-0.111*** [0.000]	-0.129*** [0.000]	-0.052*** [0.003]	-0.067** [0.024]	-0.496** [0.019]	0.577* [0.059]	0.102*** [0.000]	0.040** [0.046]
Constant	4.361*** [0.000]	9.118*** [0.000]	-0.190*** [0.001]	0.014 [0.870]	-0.053 [0.151]	-0.532*** [0.000]	-0.031 [0.264]	0.151** [0.011]	0.834* [0.063]	0.874 [0.188]	0.141*** [0.002]	0.099** [0.018]
Base line controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	10,645	7,618	10,363	7,481	10,438	7,561	10,487	7,567	10,477	7,556	10,055	7,270
R-squared	0.327	0.365	0.101	0.119	0.174	0.204	0.088	0.137	0.081	0.079	0.433	0.389

Table 10: Powerful CEOs, alternative sources of CEO power and governance measures

This table represents results of the analyses of the corporate policies of Non-Complaint firms with powerful CEOs after controlling alternative measures of CEO power and governance variables. The table includes all Non-Compliant S&P1500 firms from 1992-2014 with available information to construct powerful CEO index and excluded regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. 'Non-Compliant Firms' are firms without both majority independent board and fully independent audit committee before the SOX (1998-2001). The dependent variable in model (1) is $RD_{(t+1)} / R\&D_{(t)}$. The dependent variable in model (2) is $\log(1+\text{number of patents})_{(t+2)}$. Columns (3) to (5) include capital expenditures growth, PPE&E growth and asset growth respectively as dependent variables. The dependent variable in model (6) is 'Dividend payout ratio': dividend by total assets. The dependent variable in model (7) is $\text{Leverage}_{(t+1)}$. 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'CPS' is the CEO pay slice- the percentage of the total compensation to the top five executives that goes to the CEO (see, Bebchuk et al. (2011)). 'Only insider' is an indicator equals one if CEO is the only insider of the board. 'Institutional holdings' is proportional ownership of institutional investors. 'Dual Class' is an indicator equals one for firms with dual class shares, zero otherwise. 'Board size' is total number of board members of the firm. All models include year and firm fixed effects. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels are: *=10%; **=5%; ***=1%.

Dependent variable	[RD(t+1)/Asset(t)] x 100	CAPX Growth	PP&E Growth	Asset growth	Dividend payout ratio (t+1)	Leverage (t+1)
Models	(1)	(3)	(4)	(5)	(6)	(7)
SOX * CEO Power	0.164*** [0.005]	-0.027*** [0.010]	-0.012** [0.033]	-0.011** [0.045]	0.098** [0.028]	-0.005* [0.065]
CEO Power	-0.120** [0.013]	0.019** [0.028]	0.008 [0.114]	0.006 [0.107]	-0.081** [0.028]	0.004 [0.159]
SOX	1.166*** [0.001]	-0.651*** [0.000]	-0.157*** [0.000]	-0.135*** [0.000]	-0.400** [0.033]	0.039** [0.032]
CPS	0.313 [0.402]	0.109 [0.122]	0.092** [0.017]	0.089*** [0.010]	-0.602*** [0.001]	0.000 [0.977]
Only insider	-0.295*** [0.003]	0.033* [0.059]	0.029** [0.014]	0.009 [0.240]	0.063 [0.290]	0.001 [0.904]
Institutional holdings	-0.007* [0.093]	0.000 [0.652]	0.001 [0.135]	-0.000 [0.986]	-0.001 [0.709]	-0.000 [0.935]
Dual class	-0.331 [0.544]	-0.013 [0.703]	-0.033 [0.135]	-0.030 [0.320]	0.062 [0.745]	-0.002 [0.912]
Board size	-0.020 [0.581]	-0.020*** [0.001]	-0.009** [0.021]	-0.006** [0.044]	0.087*** [0.004]	0.002 [0.458]
Constant	6.950*** [0.000]	-0.079 [0.600]	-0.173* [0.056]	-0.041 [0.597]	0.391 [0.582]	0.133*** [0.003]
Baseline controls	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	5,684	5,377	5,285	5,630	5,385	5,666
R-squared	0.273	0.222	0.131	0.117	0.070	0.049

Table 11: Powerful CEO and SOX: Industry-Year interacted joint fixed effects

This table represents results of the analyses of the corporate policies of Non-Complaint firms with powerful CEOs using alternative econometric specifications. The analysis includes all Non-Compliant S&P1500 firms from 1992-2014 with available information to construct powerful CEO index and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. 'Non-Compliant Firms' are firms without both majority independent board and fully independent audit committee before the SOX (1998-2001). The dependent variable in model (1) include $RD_{(t+1)} / R\&D_{(t)}$. Columns (2) to (4) include capital expenditures growth, PPE&E growth and asset growth respectively as dependent variables. The dependent variable in model (5) is 'dividend payout ratio' measured by dividend by total assets in period (t+1). The dependent variable in model (6) is leverage in period (t+1). 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. All models include industry and year joint fixed effects. All control variables are from baseline regressions. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels are indicated: *=10%; **=5%; ***=1%.

Dependent variable	[RD(t+1)/ Asset(t)] x 100	CAPX Growth	PP&E Growth	Asset growth	Dividend payout ratio (t+1)	Leverage (t+1)
Model	(1)	(2)	(3)	(4)	(5)	(6)
SOX * CEO Power	0.135** [0.026]	-0.016** [0.048]	-0.009** [0.048]	-0.008** [0.031]	0.123** [0.024]	-0.006* [0.069]
CEO Power	-0.124*** [0.004]	0.012* [0.084]	0.009** [0.031]	0.008*** [0.004]	-0.052* [0.095]	0.005 [0.121]
SOX	-4.859*** [0.000]	-2.212*** [0.000]	-0.417*** [0.000]	0.186 [0.530]	-1.016*** [0.000]	0.110*** [0.000]
Constant	10.620*** [0.000]	1.907*** [0.001]	0.100 [0.402]	-0.409 [0.170]	0.582 [0.294]	-0.009 [0.893]
Base line controls	Y	Y	Y	Y	Y	Y
Industry x year fixed effect	Y	Y	Y	Y	Y	Y
Observations	8,604	7,456	8,003	7,784	7,770	8,285
R-squared	0.391	0.361	0.314	0.271	0.239	0.179

Table 12a: Powerful CEOs and overconfidence

This table represents results of the analyses of the corporate policies of Non-Complaint firms with powerful CEOs excluding highly overconfident CEOs. The table includes all Non-Compliant S&P1500 firms from 1992-2014 with available information to construct powerful CEO index, overconfidence indicator and exclude regulated, financial and utilities firms, firms with highly overconfident CEOs, and firms experiencing CEO turnover around the SOX period. 'Non-Compliant Firms' are firms without both majority independent board and fully independent audit committee before the SOX (1998-2001). CEO's overconfidence is measured following Humphery-Jenner et al. (2016). This analysis excludes observations where CEO's overconfidence measure is in the top quartile of the overconfidence variable. The dependent variable in model (1) include $RD_{(t+1)} / R\&D_{(t)}$. Columns (2) to (4) include capital expenditures growth, PPE&E growth and asset growth respectively as dependent variables. The dependent variable in model (5) is 'dividend payout ratio' measured by dividend by total assets in period (t+1). The dependent variable in model (6) is leverage in period (t+1). 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. All models include year and firm fixed effects. All control variables are from baseline regressions. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels are indicated: *=10%; **=5%; ***=1%.

Dependent variable	[RD(t+1)/Asset(t)] x 100	CAPX Growth	PP&E Growth	Asset growth	Dividend payout ratio (t+1)	Leverage (t+1)
Models	(1)	(2)	(3)	(4)	(5)	(6)
SOX * CEO Power	0.143** [0.015]	-0.020* [0.069]	-0.013** [0.011]	-0.008* [0.077]	0.102** [0.031]	-0.005* [0.085]
CEO Power	-0.114*** [0.007]	-0.002 [0.874]	0.012*** [0.005]	0.011*** [0.003]	-0.060* [0.098]	-0.002 [0.370]
SOX	1.036*** [0.002]	-0.644*** [0.000]	-0.114*** [0.000]	-0.148*** [0.000]	-0.151 [0.517]	0.006 [0.751]
Constant	4.822*** [0.000]	-0.086 [0.499]	-0.163** [0.041]	-0.213*** [0.000]	0.706 [0.128]	0.064** [0.027]
Baseline controls	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	5,332	3,536	4,915	5,355	5,260	5,169
R-squared	0.308	0.221	0.134	0.093	0.087	0.053

Table 12b: Powerful CEOs and overconfidence

This table represents results of the analyses of the corporate policies of Non-Compliant firms with powerful CEOs after controlling the effect of overconfidence. The table includes all Non-Compliant S&P1500 firms from 1992-2014 with available information to construct powerful CEO index, overconfidence indicator and exclude regulated, financial and utilities firms and firms experiencing CEO turnover around the SOX period. 'Non-Compliant Firms' are firms without both majority independent board and fully independent audit committee before the SOX (1998-2001). The dependent variable in model (1) include $RD_{(t+1)} / R\&D_{(t)}$. Columns (2) to (4) include capital expenditures growth, PPE&E growth and asset growth respectively as dependent variables. The dependent variable in model (5) is 'dividend payout ratio' measured by dividend by total assets in period (t+1). The dependent variable in model (6) is leverage in period (t+1). 'CEO Power' is an index: sum of five indicators- whether CEO is founder, CEO is chairman, CEO holds both chairman and president positions, tenure of CEOs is above the median tenure of CEOs in industry-year distribution of CEO tenure and ownership of CEOs is above the median of the CEO's ownership in industry-year distribution of CEO ownership. 'SOX' is an indicator that equals one if the observation occurs in 2002 or later and zero otherwise. 'Confidence 67' is a measure of CEO's overconfidence defined in Banerjee et al (2015). All models include year and firm fixed effects. All control variables are from baseline regressions. Standard errors are clustered at firm level. P-values are in parentheses. Significance levels are indicated: *=10%; **=5%; ***=1%.

Dependent variable	[RD(t+1)/Asset(t)] x 100	CAPX Growth	PP&E Growth	Asset growth	Dividend payout ratio (t+1)	Leverage (t+1)
Models	(1)	(2)	(3)	(4)	(5)	(6)
SOX * CEO Power	0.174*** [0.005]	-0.018** [0.048]	-0.009* [0.055]	-0.010** [0.047]	0.091** [0.046]	-0.005* [0.091]
CEO Power	-0.128*** [0.003]	0.010 [0.151]	0.008** [0.044]	0.009** [0.019]	-0.053 [0.139]	0.004 [0.164]
SOX	1.094*** [0.001]	-0.201*** [0.000]	-0.100*** [0.000]	-0.165*** [0.000]	-0.168 [0.456]	0.057*** [0.001]
SOX x Confidence_67	0.007 [0.945]	-0.032 [0.177]	-0.043*** [0.000]	-0.026* [0.054]	0.520*** [0.000]	-0.002 [0.864]
Confidence_67	-0.096 [0.407]	0.050** [0.014]	0.049*** [0.000]	0.031*** [0.005]	-0.311*** [0.001]	-0.006 [0.467]
Constant	4.861*** [0.000]	-0.171** [0.024]	-0.142* [0.068]	0.066 [0.277]	1.541*** [0.000]	0.096** [0.041]
Baseline controls	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y
Firm fixed effect	Y	Y	Y	Y	Y	Y
Observations	7,108	7,036	6,450	7,110	7,010	6,869
R-squared	0.337	0.079	0.156	0.122	0.095	0.051