Unpacking Organizational Agency in Institutional Change: The Role of Executives' Political Connections and Shareholders' Investment Horizons

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Abstract: In studies where institutional changes are initiated outside of the organization, two key actors are identified: the institutional entrepreneur, who initiates the change, and the affected organization, which is impacted. This study highlights the crucial role of the affected organization's agency in adopting new practices in response to normative institutional changes, shifting the focus beyond external initiators. We develop a novel theoretical framework that highlights the interplay between organizational agency and external institutional changes, demonstrating how strategic responses are shaped by both affected organizations and external pressures. Using the Pollution Information Transparency Index (PITI) project as a vehicle for normative institutional change, this study conducts a thorough analysis of its effect on firms' new practices—environmental innovation—employing longitudinal data (2006-2018) covering 1,988 Chinese listed industrial firms. Our findings reveal that the outcome of normative changes in fostering the adoption of new practices significantly depends on the agency of the affected organizations, moderated by executives' political connections and shareholders' investment horizons. Specifically, firms led by executives with weaker political connections or supported by shareholders with long-term investment horizons are more likely to embrace these changes, while those with stronger political connections or a short-term focus tend to resist them. This research not only bridges a significant gap in the literature by highlighting the critical role of affected organizations' agency but also expands the scope of analysis in institutional change, providing deeper insights into the complex relationship between organizational agency and institutional change.

Keywords: Institutional Theory, Normative Institutional Change, Organizational Agency, Firm Environmental Innovation, China

1. Introduction

Research on normative institutional change has advanced the discussions of why and how the redefinition of standards, values, and norms affects the organizational adoption of new practices or innovation behavior (Eberhart & Eesley, 2018). As organizations align with new institutions to gain greater support from stakeholders (Durand, Hawn, & Ioannou, 2019), they are incentivized to adapt to new practices. Among studies where the institutional changes were initiated outside of the organization, two key actors have been identified: one that initiates and diffuses the change (institutional entrepreneur), and another that is impacted by it (affected organization). While the focus has been on the initiator's agency in shaping the institutional process (Garud, Hardy, & Maguire, 2007; Hjorth & Reay, 2022), less attention has been paid to understanding the agency of the affected organization in engaging with these changes.

However, the study of the agency of affected organizations and their interplay with initiators is crucial, as these factors jointly influence organizational responses. Such organizational agency is prominent because institutional change involves more than the passive acceptance of new norms; it requires organizations to actively negotiate and reconfigure practices, utilizing their discretionary power within the normative context to critically shape the direction and impact of these changes (Battilana, Leca, & Boxenbaum, 2009; Durand et al., 2019). Without understanding the interplay between affected organizations and initiators, we cannot fully grasp the dynamic and interactive nature of institutional change. Research often focuses on the perspective of initiators to explain the outcomes of institutional changes, emphasizing alignment with either the formal or informal environment (Armanios & Eesley, 2021; Eesley, Li, & Yang, 2016; Huang, Geng, & Wang, 2017). Conversely, less attention has been paid to how affected organizations respond to these changes. Although initiators play a decisive role in defining and advocating for institutional change, the success of these changes largely depends on how organizations interpret these changes. Specifically, the affected organizations' agency role remains underexplored among existing studies where institutional change was initiated externally.

Our study fills a significant gap by exploring how organizations affected by institutional changes exercise agency to influence the adoption of new practices under different conditions. We define the concept of "agency of affected organizations", hereafter referred to as *organizational agency*, as the proactive and discretionary role organizations play when adapting to externally initiated institutional changes. Organizations exercise agency by using their internal resources and strategic influence to actively shape the impact and direction of these changes. However, agency is distributed and diffused across different parts of an organization, as various stakeholders interpret new norms in their own ways (Armanios and Eesley, 2021; Lounsbury and Crumley, 2007). This diversity in interpretation enables a more dynamic and flexible adaptation to change. Accordingly, we focus on two key internal stakeholders within firms (Fiss & Zajac, 2004; Mitchell, Agle & Wood, 1997; Pache & Santos, 2010), executives and shareholders, who wield significant influence through their political connections and investment horizons. Organizational agency manifests through these factors, with executives' political connections and shareholders' investment horizons playing a crucial role in shaping a firm's strategic decisions.

We propose that firms with different strengths of political connections, and those with different investment horizons, exercise agency differently. Executives' political connections, which determine a firm's strategic direction, enable the leverage of political capital (Sun, Hu, & Hillman, 2016; Keum, 2023). This often shields firms from the pressure to adopt significant environmental practices and influences their preference for maintaining beneficial political relationships over adhering to new institutional norms. Meanwhile, shareholders' investment horizons shape the firm's preferences for strategies that prioritize quick returns or long-term goals (García-Sánchez, Aibar-Guzmán, & Aibar-Guzmán, 2020). Long-term shareholders signal a firm's commitment to sustainable growth and the prompt adoption of environmental innovations, whereas short-term shareholders focus on immediate financial returns, often evading long-term environmental commitments. These factors—political connections and shareholders' investment horizons—craft the firm's willingness and ability to adapt to or resist new institutional demands. Varied organizational agency,

shaped by these factors, elucidates the diverse responses to institutional changes. This theoretical framework emphasizes the critical interplay between a firm's agency and external pressures, ultimately shaping the trajectory of institutional changes and organizational adaptation.

We test our hypotheses by examining the Pollution Information Transparency Index (PITI) project, a vehicle of normative institutional change, and its impact on the organizational adoption of a new practice, i.e., environmental innovation. The project aims to establish a new social standard for firms' environmental information transparency and advocate for substantial and sustainable environmental solutions. It was launched in China in 2009 by the Institute of Public and Environmental Affairs (IPE), an environmental organization acting as an institutional entrepreneur. The institutional environment in China fits our research context. Here, environmental issues are severe, regulatory interventions are limited, and public awareness is low, making the role of normative forces significant in initiating and implementing new institutional norms. This study focuses on firm environmental innovation as a strategic response to this normative change. Such innovation requires substantial R&D investments and long-term financial commitments (Bammens & Hünermund, 2023), rendering it a significant practice among alternative strategic responses and reflecting a firm's long-term commitment to addressing environmental issues. Our analysis utilizes longitudinal data from 1,988 Chinese listed industrial firms during 2006-2018 and confirms a positive impact of this initiative on firms' actions (environmental innovation).

Our study contributes to the institutional change literature by elucidating the conditions under which normative institutional changes influence the adoption of new practices and innovations through the lens of organizational agency. In contrast to previous research, which primarily explores the outcome of institutional changes by examining conditions such as the alignment between the institutional change and the formal (Eesley et al., 2016) or informal environment (Armanios & Eesley, 2021; Huang et al., 2017), our analysis shifts the analytical focus from the role of external initiators to the agency of affected organizations. We broaden the scope of analysis by highlighting that the outcome of institutional change is shaped by an interplay between

organizational agency and external pressures. Key internal decision-makers, executives and shareholders, play crucial roles in interpreting and responding to normative demands (Durand et al., 2019). We pinpoint two pivotal factors of these internal stakeholders—executives' political connections and shareholders' investment horizons—as critical in influencing a firm's willingness and ability to embrace or resist change. These factors are key because they directly impact the organizational resources, capabilities, and interests, thereby determining strategic priorities and decisions (Keum, 2023; Nguyen, Kecskés, & Mansi, 2020; Ryan & Schneider, 2002; Wang & Qian, 2011).

By analyzing political connections and investment horizons, we demonstrate their influence on a firm's view of the importance of new institutional norms and the potential benefits and costs associated with adapting to or resisting these demands. We find that firms with weaker political connections and long-term investment horizons are more likely to adopt new practices, whereas those with stronger connections and short-term horizons are reluctant to adapt. This supports our theory that the interplay between organizational agency and external pressures significantly affects the outcomes of normative change. This perspective integrates the concept of agency into a broader framework of institutional change and impact, responding to scholarly calls (Jastram, Otto, & Minulla, 2023) to extend beyond traditional external initiators.

2. Theoretical and institutional background

2.1 Institutional changes and organizational response

Institutional entrepreneurs play a crucial role in initiating and driving institutional change. They articulate visions that justify the necessity of deviation from current practices and persuade others to adopt new norms (Battilana et al., 2009; Garud et al., 2007). Existing research often highlights the role of "muscular" or "heroic" actors, who leverage their resources and influence to drive and implement institutional change (Garud et al., 2007; Hjorth & Reay, 2022). Institutional entrepreneurs identify and articulate problems, shortcomings, and defects within existing institutions; they

advocate for new practices and ideologies, thereby facilitating the construction of new institutional frameworks that promote the evolution and optimization of social and organizational structures (Battilana et al., 2009). Such transformations can be triggered by external factors such as changes in government regulations, redefinition of professional codes, and new social expectations (Eberhart, Eesley, & Eisenhardt, 2017; Huang et al., 2017; Eberhart & Eesley, 2018; Tomaselli, Ebbers, & Torluccio, 2022).

However, the outcomes of these changes also heavily depend on the means of adaptation and the internal dynamics of the affected organizations. Among the existing research, scholars focus on the alignment between the institutional change and the formal or informal environment, rather than the interplay between organizational agency and external changes. For example, Eesley et al. (2016) found that misalignment between the innovation encouraged by normative change and the broader institutional environment results in change failure. Huang et al. (2017) found that Chinese firms rely more on informal norms, which may lead to a reluctance or slower adaptation to changes in formal rules and regulations. Armanios & Eesley (2021) found that the effective organizational response to institutional change requires not only regulatory elements, but also more normative and cognitive support. These discussions overlooked the organizational agency in participating in the institutional change process and shaping outcomes.

Organizations affected by institutional change often serve as crucibles in which change is adopted, resisted, or modified, significantly influencing the pace, direction, and outcomes of these changes (Battilana et al., 2009; Eberhart et al., 2017). Key internal stakeholders within these organizations have varying sensitivities to institutional change (Wright & Zammuto, 2013). When the values and interests of internal stakeholders within firms are aligned with these changes, they actively use their actions, resources, and influence to promote change. In contrast, they may resist or oppose changes to preserve the existing institutional order or protect their own vested interests (Waldorff & Madsen, 2023). Different configurations and preferences within an organization crucially determine its response to external institutional pressures and embody organizational agency in navigating change. For example, current research

identifies executives' potential benefits (Yeung, Lo, & Cheng, 2011), executive capabilities (Eberhart et al., 2017), and executive cultural identity (Luo, Chen, & Chen, 2021) as significant factors driving organizational adaptation to institutional change. In addition, shareholders' local investment preferences (Jung & Mun, 2017) and larger size (Jung, 2014) hinder the adoption of new practices. Thus, understanding how organizational agency to embrace or resist change is crucial to comprehending the extent to which institutional change affects organizations.

Agency influence tends to be prominent in the context of normative change (Durand et al., 2019). This is because normative forces are enacted through processes of normativity rather than coercion, influencing by increasing the salience of issues and granting organizations greater freedom of choice (Eberhart & Eesley, 2018). Normative change is often driven by binding expectations and is a voluntary behavioral norm that encourages organizations to voluntarily comply with relevant norms and fulfill their social citizenship obligations to the extent possible (Scott, 2014). In this context, high levels of discretion exacerbate the uncertainty of institutional change outcomes, influencing the manner and trajectory of change in organizations. In particular, when internal stakeholders within organizations possess divergent values and willingness for normative changes, this discretion enhances organizational agency by mobilizing firm resources to support actions aligned with their specific values and willingness. Therefore, understanding the affected organizations' agency within the normative institutional context is crucial to comprehending how it steers the outcomes of institutional change.

2.2 Normative change and new practices

Normative institutional change refers to changes in social norms, values, standards, and expectations that can affect organizational behavior and outcomes (Scott, 2014; Eesley et al., 2016). Normative forces play the role of institutional entrepreneurs by defining new institutions and diffusing new standards, values, and norms (Eberhart & Eesley, 2018). Newly defined institutions motivate organizations to re-evaluate the

salience of certain social issues, and to alter incentives regarding organizational conformity, subsequently leading to the reassessment of the appropriateness of existing/old practices (Jones & Massa, 2013; Eberhart & Eesley, 2018). For example, new appropriateness initiated by professional actors can change organizational perceptions of the inadequacy of existing investment standards (Lounsbury & Crumley, 2007), and can force game clubs to acknowledge the obsolescence of current game modes (Wright & Zammuto, 2013). Conforming to new norms can improve legitimacy, reputation, and customer loyalty, while adhering to old institutions may promote obsolescence and bear potential costs such as illegitimacy, resource constraints, and conflicts with other stakeholders (Jones & Massa, 2013; Durand et al., 2019).

The normative change literature shows that the impact of normative forces varies across sectors. Industry associations shape professional norms, such as silk associations driving the emergence of new silk design professions (Dupin, Wang, & Wezel, 2022). Entrepreneurial incubators support start-ups with essential resources, influencing new firm trajectories (Hallen et al., 2020; Assenova, 2020). Universities and science parks bolster technological development and patents (Armanios & Eesley, 2021). Social groups like cricket clubs foster new activities through professional networks and events (Wright & Zammuto, 2013). These cases illustrate how normative forces can spur innovative new practices.

Despite these insights, the literature presents contradictory findings regarding the impact of normative changes on innovation. For example, Sine, Haveman, & Tolbert (2005) found that trade associations, when influenced by established incumbents, are more likely to promote entrepreneurship around conventional technologies rather than innovative ones. These discrepancies may stem from whether normative forces are independent or supported by specific interest groups (Zietsma, Groenewegen, Logue, & Hinings, 2017), such as fund managers benefiting from different investment ideas (Lounsbury & Crumley, 2007), clubs benefiting from entertainment models (Wright & Zammuto, 2013; Munir, Ansari, & Brown, 2021), and market intermediary organizations benefiting from business norms (Eberhart & Eesley, 2018; Assenova, 2020). Therefore, during institutional change, independent normative forces and non-

independent ones (such as those funded by existing interest groups) may generate different outcomes (Van Wijk, Stam, Elfring, Zietsma, & Den Hond, 2013). Our research focuses on normative forces that are independent of government and large incumbents in high-pollution industries and that represent the collective interests of the public.

2.3 Institutional background of the PITI project

In the past decades, China's rapid industrialization has led to severe environmental challenges, with the country hosting 16 of the world's most polluted cities in 2006. Local governments, driven by the central government's emphasis on economic growth, often implemented lax regulatory frameworks and weak enforcement, and engaged in practices akin to pollution rent-seeking (Tu, Hu, & Shen, 2019; Li, Liu, Weng, & Zhou, 2019). Given this scenario, firms' willingness to engage in environmental practices is low, largely because the consequences they face are limited to verbal warnings and minor financial penalties imposed by the government. For example, the pollution incident at Zijin Mining Group in 2010, one of China's significant pollution events, resulted in the death of millions of kilograms of fish and a direct economic loss of 31.87 million yuan. However, the firm only paid 9 million yuan in compensation.

Against this background, the Institute of Public and Environmental Affairs (IPE) (the largest professional environmental organization in China) raised significant concerns over severe environmental challenges and began to elevate environmental issues to a prominent position in public discourse. To avoid interference from the government or its agencies, 90% of the IPE's funding comes from social donations, as confirmed by its director who stated: *"we don't reply on government bodies and we accept no funding from them."* In other words, the IPE is a professional and government-independent environmental organization (*see Section 1.2 of Appendix 1, and Appendix 2 for interviews 1a, 2b, 3b, 4e, and 5c in the online supplemental material*). The IPE's core strategy is to maximize social participation through

promoting the transparency of environmental information and informing the public about pollution.

Acting as the institutional entrepreneur, the IPE aims to establish a new social standard for environmental information transparency. It launched the Pollution Information Transparency Index (PITI) project in June 2009 as a vehicle to effectively implement the new environmental norms. The initial PITI was jointly released by IPE and other environmental organizations, and has since been led by the IPE. The PITI provides a comprehensive evaluation system, assigning scores to 113 of over 300 cities, creating a quantitative benchmark to measure the status of environmental information disclosure in various urban areas. The PITI evaluation system was adapted from the well-known Global Reporting Initiative Standards, with necessary modifications to adapt to China's local conditions (*see Section 1.5 of Appendix 1 for evaluation details in the online supplemental material*).

By implementing and advocating a standardized evaluation system, the PITI project seeks to create a norm that redefines corporate environmental responsibility. Firstly, the PITI facilitates extensive public engagement and social oversight through the "Pollution Map" (*see sections 1.4 and 1.5 of Appendix 1 in the online supplemental material*), as normative change necessitates an effective social pressure mechanism (Jastram et al., 2023). Central to the PITI strategy is its approach to evaluating urban areas by examining the prevalence of polluting firms and publicly listing the least compliant major firms. This transparency measure leverages social monitoring as a tool to enforce better environmental standards.

Secondly, continuous pollution research on industries and firms, such as the professional publications, further spurred the recognition that one must be clean to become an exemplar. Such continuous professional advocacy not only facilitates the instantiation of environmental responsibility but also gradually promotes the establishment of new business practices that prioritize environmental concerns, thereby disseminating the norms of environmental responsibility more broadly.

Thirdly, the growing participation and recognition of more actors makes sustainable clean practices a widely accepted norm, and the IPE leverages the PITI

initiative to serve as a platform where a growing number of environmental stakeholders are inclined to support greener firms (*see sections 1.5 and 1.6 of Appendix 1 in the online supplemental material*). According to Jones & Massa (2013), the growing involvement of diverse social actors helps to create robust normative pressure that supports the institutionalization of the new standards.

Based on the elements above, we posit that the PITI project forms a normative institution—not as a fixed set of norms, but an active, evolving process shaped by continuous behaviour over time. This view draws on perspectives from the Chicago School of Organizations, particularly Abbott's (2009) idea that institutions are not static "nouns" but dynamic "verbs". In this perspective, institutions are ongoing processes influenced by actions, interactions, and the evolving agency of the organizations involved. This approach supports Barley's (2008) critique of traditional institutional theory, which tends to overemphasize stable, taken-for-granted norms. Instead, this critique supports the idea that normative institutions, like the PITI project, are maintained through ongoing engagement and active agency of involved organizations. Our theorization emphasizes that organizational agency is essential for forming and sustaining normative institutions. The PITI project demonstrates this dynamic by providing a platform where organizations actively engage and respond to evolving norms. Therefore, the PITI represents a normative institutional change that is continuously shaped by agency-driven actions aligned with changing norms, with organizational agency and responding practices playing a central role in its ongoing formation.

3. Hypotheses

3.1 Main effect of normative changes on firm environmental innovation

When organizations undergo normative change, those operating within these institutional influences need to re-evaluate the significance of new norms for their growth (Eberhart & Eesley, 2018). Conformance with new norms can increase legitimacy, whereas not adhering to new institutions may lead to obsolescence and illegitimacy (Wright & Zammuto, 2013; Munir et al., 2021). The PITI seeks to establish

a new norm of environmental information transparency, and in so doing it exposes corporate polluting activities to public scrutiny in two main ways: (1) This visibility forces firms to be accountable for their environmental practices because they are now visible not only to regulators, but also to the public, investors, and other stakeholders; (2) Increased transparency empowers stakeholders to make informed decisions regarding their interactions with a firm. For example, investors may choose to support firms with better environmental records. Thus, the normative expectations of transparency become a driving force for corporate clean practices, encouraging firms to engage in the development of responsible, sustainable pollution solutions.

Normative institutional change reshapes the value frameworks of organizations and their stakeholders, achieved through commensuration – a process of comparison and evaluation (Munir et al., 2021). The PITI's evaluation system establishes a common metric that makes the impacts and merits of different environmental solutions more transparent. On the one hand, the PITI's positive/negative list project allows firms to benchmark their environmental performance against industry standards or peers, facilitating the easy identification of best practices and discouraging/outdated practices in terms of appropriateness. As one business owner stated, *"without change, we'll remain on PITI's pollution blacklist." (See Interview 2b of Appendix 2 in the online supplemental material).*

On the other hand, the continuous publication of annual pollution reports allows firms to compare their environmental performance with past performance. This comparison can continually create new norms and expectations that motivate firms to set higher environmental standards, strive to improve their performance, and make long-term clean changes. As one business owner stated, *"for years, being at the bottom of pollution reports has felt threatening to us." (See Interview 2c of Appendix 2 in the online supplemental material).*

In addition, normative institutional change requires the initiator to make continuous efforts to stabilize new institutions (Jones & Massa, 2013). The PITI project implements a series of continuous monitoring measures. Corporate polluting behaviors are persistently reported through the "red labels" of the "Pollution Map", and

irresponsible environmental practices face ongoing censure through negative lists. This continuous monitoring represents an expectation of long-term adherence to and maintenance of newly defined norms, signaling to firms that pollution issues require long-term solutions, not just short-term fixes. As a result, firms that commit to long-term clean practices receive more recognition and support, such as bank loan incentives and preferred green options for downstream firms. According to one business owner *(Interview 2a of Appendix 2 in the online supplemental material), "PITI, together with our downstream clients, criticized our pollution issues. Facing the threat of loss of customers, we developed a new clean fabric to build long-term green competitiveness."*

When faced with external environmental pressures, firms' strategic responses vary from inaction and symbolic actions to substantive actions. Inaction or symbolic actions subject firms to strong condemnation and even social sanctions due to PITI's professional comparison and evaluation. Acquiring environmental technology or equipment, while requiring firms to mobilize substantial resources to some extent, often represents end-of-pipe treatment. Such approaches struggle to fundamentally solve pollution problems and rarely demonstrate a long-term commitment that distinguishes a firm from its peers (Berrone & Gomez-Mejia, 2009; Ren, Huang, Liu, & Yan, 2023).

Our research focuses on environmental innovation, the most substantial practice among these ways, because it represents a strategic action indicating a firm's commitment to its long-term positioning. Although environmental innovation involves certain financial risks, it can offer competitive advantages by differentiating the firm from competitors, minimizing environmental legitimacy risks, and gaining more social recognition and support from customers, suppliers, and supply chain partners (Berrone, Fosfuri, Gelabert, & Gomez-Mejia, 2013). Moreover, environmental innovation promotes a win-win for economic and environmental performance by addressing the social problems of pollution through sustainable corporate development. Thus, environmental innovation provides an innovative, integrated solution that addresses environmental issues while offering economic and social benefits (Bammens & Hünermund, 2023). As a forward-looking, substantial, and long-term approach, environmental innovation meets the growing normative expectations for environmental

responsibility and is the best strategic option for responding to continuous, normalized external pressures.

Overall, we predict a baseline hypothesis that:

H0*: Normative institutional change has a positive effect on firms' environmental innovation.*

3.2 Moderating effect

The agency role of affected organizations is critical within a normative institutional context because they often possess a higher level of discretion within such environments (Durand et al., 2019). This discretion allows them to actively engage with the institutional process, influencing the direction and impact of normative changes rather than merely conforming passively. When institutional changes are initiated externally, the organizational agency is manifested by internal actors who possess both the power and legitimacy to navigate these changes. The legitimacy and capability of internal actors to effect changes are critical to identifying who matters in the institutional process (Luo et al., 2021). These influential actors within the organization must not only be equipped and qualified to implement or resist changes but also gain the trust and support of other decision-makers. This enables them to effectively guide the organization's strategic direction, whether to embrace or resist the changes. We unpack the agency role of affected organizations by focusing on two internal actors—executives and shareholders. They were identified as dominant stakeholders of a firm (Mitchell et al., 1997; Pache & Santos, 2010), who held both power and legitimacy to exercise influence on the strategic directions and operational strategies of the firm (Fiss & Zajac, 2004; Tashman & Raelin, 2014).

We specifically examine how the characteristics of these key internal actors—executives' political connections and shareholders' investment horizons—critically influence the firm's resources, capabilities, and interests. These factors ultimately shape its strategic priorities and decision-making (Keum, 2023; Nguyen et al., 2020; Ryan & Schneider, 2002; Wang & Qian, 2011). By analyzing executives' political connections, we gain insights into a firm's ability to leverage political capital for accessing resources,

navigating institutional environments, and influencing policy—factors that are well-documented to affect strategic decisions (Sun et al., 2016; Keum, 2023). This analysis helps us assess the firm's inclination towards conforming to new institutional norms, whether driven by a dependency on resources for legitimacy or the capabilities to withstand institutional pressures. Moreover, examining shareholders' investment horizons (categorized by long-term and short-term) reveals the firm's specific interests, such as pursuing immediate financial return or sustainable growth. These interests crucially influence the firm's strategic preferences (Nguyen et al., 2020), directing its readiness to adopt new practices that support long-term growth objectives.

We posit that political connections and investment horizons empower firms either to align with or diverge from new institutional norms, echoing Durand and colleagues' (2019) emphasis on the critical roles of willingness and ability in organizational responses to normative pressures. Evaluating these aspects allows us to illustrate how organizational agency shapes strategic responses to institutional changes. We hypothesize that varying strengths of political connections and diverse investment horizons guide firms' decisions on adopting new practices, suggesting that those with strong political connections and a focus on long-term investment from shareholders are more proactive and successful in embracing environmental innovations. This nuanced examination deepens our understanding of the impact of organizational agency on strategic decision-making.

3.2.1 The moderating effect of political connections

Political connections, as defined by Li & Liang (2015), are the social ties between executives and government agencies or officials. These connections significantly impact access to political resources, comprehension of government requirements, preferential treatment, and protection (Sun et al., 2016). Such connections not only grant executives enhanced access to governmental resources and special treatments, but also allow them significant control over their organizations' strategic direction, especially for organizations in our sample from China (Sun et al., 2016; Keum, 2023).

Thus, a firm's political connections affect its ability to navigate institutional pressures and align its organizational practices with new norms.

Firms with strong political connections often use their leverage to effectively mitigate external pressures (Sun et al., 2016; Yao, Guo, & Tsinopoulos, 2022). Their executives' stable relationships with government entities provide them with protective measures and preferential policies, which lessen their need to promptly align with evolving normative standards (Wang & Qian, 2011). Such firms can secure political shields to evade environmental responsibilities (Xiao & Shen, 2022). As a result, they prioritize maintaining beneficial political alliances over complying with emerging institutional expectations, such as environmental norms and innovations, because their business models and profits often depend heavily on these political connections (Li & Liang, 2015; Yao et al., 2022). This reliance on political connections can lead to a conflict between the ability to maintain the status quo and the pressures for change. Thus, when these firms encounter new normative institutional demands, their existing political connections provide sufficient legitimacy and resources (Armanios & Eesley, 2021), allowing them to meet only the minimum government standards rather than pursuing more extensive environmental innovations. Even in the face of continuous pressure, these firms are more likely to use their political connections to mitigate additional social pressures at a lower cost by maintaining strong government relationships.

In contrast, firms lacking strong political connections may react differently under the same institutional changes. Lacking the political buffer, these firms are more exposed to and pressured by external normative demands. Their typical response involves closer alignment with these demands to maintain or enhance the organization's external legitimacy (Sun et al., 2016). They may advocate for adapting to new institutional norms and embracing innovative practices, viewing such adaptation as essential for the organization's long-term sustainability and compliance with broader social expectations (Wang & Qian, 2011). If these firms can respond to these normative changes by adopting environmental innovation, they can enhance their competitiveness in the market and gain greater recognition and support. Therefore, facing greater

uncertainty due to change, these firms are compelled to actively engage with normative changes to adapt to the new norms.

In summary, the strength of executives' political connections between these firms can define the organization's strategic response to initiatives like the PITI project, which promotes environmental innovation in response to normative changes. While firms with strong political connections might view these innovations as risky and potentially detrimental to immediate financial gains (Berrone et al., 2013), those with weaker connections might push for a proactive alignment with environmental standards, arguing that such alignment supports the organization's pursuit of legitimacy and long-term viability. Consequently, firms inclined to leverage their executives' political capital to buffer against new institutional norms, and those seeking to align the organization more closely with normative and social expectations, adopt different response strategies.

Therefore, we posit that:

H1: *The effect of normative institutional change on firms' environmental innovation is weaker when executives' political connections are stronger.*

3.2.2 The moderating effect of shareholder presence

Shareholder presence, particularly the distinction between long-term and short-term shareholders, significantly impacts firms' adaptation strategies in response to new institutional norms. Specifically, these two types of shareholders often have different investment objectives and behavioral patterns (Nguyen et al., 2020). The diverse interests and expectations of these types of shareholders influence their investment horizons. The differences in such horizons will affect the salience of normative change, i.e., the willingness of firms to prioritize and interpret institutional requirements, thereby influencing their responses (Schnatterly & Johnson, 2014).

Long-term shareholders, such as pension funds and social security funds, expect long-term returns and leverage their influence to champion sustainable growth (García-Sánchez et al., 2020). Their commitment and preferences to long-term value creation empower them to drive strategic decisions that align with environmental norms. Under

the new norms advocated by the PITI project, multiple stakeholders recognize the importance of environmental protection. In this context of widespread clean expectations, a firm's future commitments to cleanliness become more scrutinized and anticipated (Garel & Petit, 2021). They will realize that environmental innovation strategies are relatively more attractive compared to those in existence before the clean transformations introduced by the PITI project. Environmental innovations adopted by firms in response to new norms also align more with the objectives of long-term shareholders and gain more resources and support, while superficial environmental solutions are seen as threats to long-term risk (Berrone & Gomez-Mejia, 2009). Moreover, under continuous pressure, the social impact of corporate environmental behavior is particularly sensitive to long-term shareholders, thereby adding greater value to long-term solutions (Garel & Petit, 2021). This preference for long-term value creation facilitates the adoption of proactive environmental strategies that resonate with initiatives such as the PITI project.

In contrast, short-term shareholders, including brokers and banks, are primarily focused on short-term profits and prioritize immediate financial returns (Ryan & Schneider, 2002). Their influence can steer a firm away from committing to new environmental norms due to the risks and long-term investments required by environmental innovations (Berrone & Gomez-Mejia, 2009). On one hand, short-term shareholders may undervalue long-term environmental practices, as the financial benefits of environmental innovations can only be realized over the long term. This misalignment often results in a disregard for broader normative claims by other social entities. On the other hand, firms with a stronger presence of short-term shareholders focus on immediate financial returns, which may lead them to opt for easier solutions that can be achieved more quickly and at lower costs, often at the expense of substantial environmental innovation (García-Sánchez et al., 2020).

The investment horizons of these shareholder groups have a significant influence on a firm's willingness to embrace or resist environmental innovation. The strong presence of long-term shareholders is likely to lead to a strategy more aligned with environmental norms, reflecting a higher degree of willingness to embrace the

risks associated with such innovations (Garel & Petit, 2021). Conversely, the strong presence of short-term shareholders might deprioritize environmental innovations in favor of strategies that promise immediate financial returns, even at the expense of long-term sustainability and alignment with environmental standards.

In sum, we hypothesize that:

H2a: *The stronger presence of long-term shareholders strengthens the positive relationship between normative institutional change and firms' environmental innovation.*

H2b: *The stronger presence of short-term shareholders weakens the positive relationship between normative institutional change and firms' environmental innovation.*

4. Methodology

4.1 Sample and data collection

To explore the impact of normative institutional changes on environmental innovation, we take the PITI project as a quasi-natural experiment. In June 2009, the PITI project conducted a national evaluation of environmental information disclosure involving 113 of China's 300+ cities. This evaluation is implemented annually, and in 2013 it was extended to 120 cities. As a pilot policy, the PITI cities are widely distributed in the eastern (developed), central, and western (undeveloped) regions of China (Tu et al., 2019). Thus, this policy provides an ideal quasi-natural experimental setting to observe the net impact of normative changes on corporate environmental innovation.

Our initial sample includes all A-share industrial (mining, manufacturing, construction, and electricity) firms listed on the Shanghai and Shenzhen stock exchanges between 2006 and 2018. Financial information and regional information on listed firms is available from the China Securities Market and Accounting Research (CSMAR) and Wind databases. Environmental patent data are from the CSMAR database, which provides complete information on patent applications and patent grants

in China (including patent application number and year, patent type, patent owner, and international patent classification (IPC) code). We also collected data on environmental enforcement, GDP, and industry structure from the China Environment and Urban Yearbooks.

We constructed the sample as follows: 1) we excluded special treatment firms (ST/*ST), which left a sample of 2,025 industrial firms; 2) In 2013, the PITI project's sample increased to 120; for consistency, we deleted an additional seven, meaning that 37 firms in the seven cities of Zhenjiang, Sanmenxia, Zigong, Deyang, Nanchong, Yuxi, and Weinan were excluded. Our final sample includes 25,844 observations of 1,988 industrial firms in the period 2006-2018.

4.2 Measurement of the variables

4.2.1 Dependent variable

Environmental innovation (EI): Following the literature (Berrone et al., 2013), we measure environmental innovation as the number of environmental patent applications. We distinguish environmental patents from other patents using IPC codes, which reflect the technical field of the patent (Zhu, Fan, Deng, & Xue, 2019). Following prior works (Berrone et al., 2013; Ren et al., 2023), we use the natural logarithm of environmental patents plus 1. In a robustness test, we use the number of patent citations and environmental invention patents as alternative measures of environmental innovation. And we also choose the negative binomial model as the robustness test.

4.2.2 Independent variable

Normative institutional change (normative change): Our variable of interest is the interaction between *treat* and *change*. If the firm is located in a PITI city, *treat* takes the value 1 and 0 otherwise. Given that the first announcement of the PITI project was announced in June 2009, we refer to 2006-2008 as the pre-policy period, and the *change* in value is 0, and 2009-2018 as the post-policy period, and the *change* in value is 1.

4.2.3 Moderating variables

Political connections (political): We quantify the intensity of political connections among senior executives by dividing the number of part-time positions and previous roles held by senior executives in government agencies (e.g., executive, legislative, judicial, and the Chinese People's Political Consultative Conference) by the total number of senior executives.

Ratio of short-term institutional shareholders (hold-short): We follow prior work and measure the presence of short-term shareholders by using the r*atio of short-term shareholders* as the proportion of total shares held by securities and banks (Schnatterly & Johnson, 2014).

Ratio of long-term institutional shareholders (hold-long): Again, in line with prior work, we measure the presence of short-term shareholders by using the *ratio of long-term shareholders* as the proportion of pension and social security funds (Nguyen et al., 2020; García-Sánchez et al., 2020).

4.2.4 Control variables

Controlling for some firm characteristics is designed to capture other factors that might affect environmental innovation performance. We control *Firm age, Firm size, ownership, ROA, LEV, R&D intensity, board independence, per-GDP, urban industrial structure, unemployment rate, urban polluting emissions (*total sulfur dioxide emissions*), and environmental enforcement intensity* (EFI). EFI is measured by the logarithm of the number of environmental administrative penalty cases (Huang & Chen, 2015). In particular, we also control whether a firm is included in the government's mandatory information disclosure program (Ren et al., 2023).

4.3 Models

We employ a difference in differences (DID) model to study China's PITI project since it introduces fewer endogeneity problems (Tu et al., 2019). The regression model is set as follows:

$$EI_{it} = \beta_0 + \beta_1 treat_i * change_t + \beta_2 MV_{it} + \beta_3 treat_i * change_t * MV_{it} + \beta_4 Controls_{it} + Industry_c + Year_t + City_w + \varepsilon_{it}$$

where EI_{it} is the dependent variable representing the environmental patents of firm i in year t. $Treat_i * change_t$ is the independent variable (*Normative institutional change*). MV_{it} are the moderating variables. $Controls_{it}$ is a set of control variables including firm-level and region-level controls, and $Industry_c$ $Year_t$ $City_w$ are industry, time, and city fixed effects. We use heteroskedasticity-robust standard errors.

5. Empirical results

5.1 Descriptive statistics

Table 1 reports the descriptive statistics for all the variables included in our benchmark regression. It shows that the minimum and maximum values of environmental patent are respectively 0 and 781 (calculated as exp. (6.662) - 1), which is a large difference; the standard deviation is 0.562, which indicates that some firms have better environmental innovation performance. The results of a T-test for the two groups before the policy show that there are no significant differences between PITI and non-PITI firms.

[Insert Table 1 about here]

Table 2 reports the Pearson correlation coefficients of the variables and shows that they are not highly correlated.

[Insert Table 2 about here]

5.2 Validating the parallel trend assumption in the DID design

DID estimation assumes that both treatment and control groups satisfy the parallel trend assumption. To test whether the parallel trend assumption is effective, we compare the increase in environmental innovation in the two groups before and after the pilot. Figure 1 shows that before 2009, the treatment and control groups had a similar tendency for engagement in environmental innovation, which supports the parallel trend assumption. After 2009, environmental innovation increased much faster in the treatment group compared to the control group, preliminarily indicating that the PITI project had a positive impact on environmental innovation.

[Insert Figure 1 about here]

5.3 Hypotheses testing

Table 3 presents the results of the DID regression analysis of the effects of the PITI project on environmental innovation. Column 1 includes only the control variables and fixed effects. Column 2 adds the independent variable. Normative institutional change and environmental innovation are significantly positive ($b = 0.126$, $p < 0.01$), which supports H0.

In Column 3, the interaction between normative institutional change and political connections is significantly negative ($b = -0.043$, $p < 0.1$), indicating that political connections have a negative moderating effect on the relationship between normative change and environmental innovation. This supports H1.

In Column 4, the interaction between normative institutional change and short-term institutional shareholders is significantly negative ($b = -0.563$, $p < 0.01$), indicating that short-term institutional shareholders have a negative moderating effect on the relationship between normative change and environmental innovation. In Column 5, the interaction between normative change and long-term institutional shareholders is significantly positive ($b = 2.016$, $p < 0.05$), showing that the firm's long-term institutional shareholders have a positive moderating effect on the relationship between normative change and environmental innovation, which supports hypotheses H2a and H2b. Column 6 is the full model, including all the interactions; the significance does not change.

[Insert Table 3 about here]

5.4 Robustness checks

We have placed details of the robustness checks in ***Appendix 3*** in the online supplemental material. Specifically, we employed the following eight methods: 1) propensity score matching, 2) coarsened exact matching, 3) continuous DID, 4) dosage-dependence checks, 5) alternative regression model, 6) alternative measurements, 7) eliminating the effect of other policy events, 8) generalized synthetic control method,

9) Heckman model, 10) alternative subsample.

6. Discussion and conclusion

6.1 Theoretical implications

Our study explores the conditions under which normative institutional changes drive organizations to adopt firm innovation practices. It advances the discourse on institutional change by shifting the focus from external change initiators to the complex roles of organizational agency in responding to these changes.

We break new ground by broadening the scope of analysis, illustrating that the outcome of normative changes is not solely contingent upon external forces but is deeply entwined with the organization's internal fabric. This perspective underscores how organizations, endowed with discretion, actively shape the direction and outcomes of these changes. By emphasizing the interplay of organizational agency and external pressure, our approach extends discussions within institutional change beyond external initiators, echoing scholars' suggestions (Jastram et al., 2023). This helps bridge a significant gap in understanding the multifaceted nature of normative institutional change.

Our research allows for a nuanced understanding of how agency varies in scope, intent, and impact depending on its level and position within the institutional change process. We identify two levels of conceptual analysis of agency in this study. The first distinction is between the agency of initiator and the agency of affected organization. Initiators' agency acts as a proactive, deliberate force aimed at catalysing institutional changes, establishing their role as the 'protagonist' in driving change (Battilana et al., 2009). For affected organizations, however, agency involves responding to change with discretion, interpretation, and strategic engagement rather than direct control; their agency is expressed through interpretation rather than counteraction (Armanios & Eesley, 2021; Lounsbury & Crumley, 2007). The second distinction is between the agency of an affected organization seen as a single entity and the agency of an organization as a collective of pluralist entities. When seen as a single entity, an organization's agency appears unified and consistent in its response to change. In

contrast, when viewed as a collective of pluralist entities, agency becomes more distributed and diffuse (Pache & Santos, 2010), as diverse internal stakeholders (e.g., executives, shareholders) interpret and respond to new norms in varied ways. In our study, we treat organizational agency as that of an organization composed of pluralist entities, recognizing its internal diversity. This distributed agency suggests that, while affected organizations exercise discretion, they are constrained by external institutional pressure and internal diversity, limiting their ability to directly influence outcomes. Therefore, affected organizations are positioned as adaptive responders rather than initiators of change.

This study underscores the pivotal roles played by organizational agency, particularly manifested through two factors tied to key internal stakeholders, executives' political connections and shareholders' investment horizons, within a normative context. Both factors critically influence a firm's strategic orientation and its readiness to adapt to or resist changes, thus embodying the essence of organizational agency. Our findings indicate that firms with strong political connections often resist normative shifts promoting environmental innovation, preferring to maintain the status quo. This resistance occurs because such firms, when not dependent on aligning with normative changes for resources, find the benefits of inaction or symbolic actions outweigh those of taking substantial actions. It indicates a reduced willingness to embrace the normative change. Furthermore, the ability to leverage political connections as a strategic shield can effectively reduce the costs associated with not adopting substantial actions.

Our results further suggest that firms with a strong presence of long-term shareholders, who are generally aligned with sustainable practices, are more inclined to support and drive towards environmental innovation. In contrast, the presence of short-term shareholders typically encourages strategies that prioritize immediate financial returns, potentially at the expense of long-term innovation and sustainability. This dynamic illustrates that alignment between an organization's interests and the values promoted by normative changes fosters a stronger willingness to mobilize firm resources to support actions reflecting these interests. However, a misalignment

dampens this willingness, and firms are less likely to make such resource commitments. This stark difference underscores the complex interplay between organizational agency and external pressures in shaping strategic responses to institutional changes.

These findings illuminate the mechanisms through which organizational agency steers the strategic direction towards or away from the intended outcomes of normative changes. They highlight how political connections and investment horizons not only reflect but actively configure the firm's perception of the importance of new institutional norms and the potential benefits and costs associated with adapting to or resisting these demands.

Our study offers an institutional perspective on agency, addressing a gap in existing research as follows: By treating the organization as composed of pluralist entities, we acknowledge that organizational agency is not monolithic but distributed across internal stakeholders with distinct interests and influences. This approach captures the nuanced, internally diverse nature of organizational agency. Moreover, our study underscores the significance of understanding this interplay to fully grasp how internal (organizational agency) and external (external pressures) factors jointly influence the outcomes of normative changes. We demonstrate that individual agency from key stakeholders (such as executives with strong/weak political ties, shareholders with long-/short-term horizons) functions not simply as a matter of strategic choice, as in Oliver (1991) sense, but as a strategic interaction. Despite internal diversity, a more cohesive strategic response can still emerge, particularly when moderated by the interests and influences of key stakeholders. This capacity to consolidate strategy overcomes the often disjoint and diffuse nature of distributed organizational agency. By emphasizing the distributed nature of organizational agency and its impact on strategic response, our study enriches the institutional literature.

Building on these insights, we draw parallels with recent literature on institutional change, which has greatly advanced our understanding of how institutional changes influence organization adaptation of novel practices or innovations (Armanios & Eesley, 2021; Eesley et al., 2016; Huang et al., 2017). The closest to our study among them is the work from Eesley and colleagues (2016). Similar to our study, it places great

importance on the alignment between key factors to explain the outcome of institutional changes. They observed that the Project 985 initiative in China, despite fostering innovation among university graduates, led to financially less successful ventures due to a misalignment between the innovation encouraged by institutional changes and the broader institutional environment, such as embodied in weak enforcement of intellectual property laws. Unlike their focus primarily on external change initiators and environmental factors, our study extends the discussion by incorporating the influence of firms' political connections and investment horizons, thereby offering a more comprehensive view that encompasses both organizational agency and its interplay with external institutional forces. Our approach responds directly to calls for a deeper investigation into the process of institutional change (Alvesson & Spicer, 2019; Jastram et al., 2023; Micelotta, Lounsbury, & Greenwood, 2017; Sine, Cordero, & Coles, 2022) by highlighting the profound relationship between organizational agency and external pressures in the broader institutional context.

Furthermore, our study diverges from prior mixed evidence on normative changes' impact on innovation, showing that the independence of normative forces from any specific interest group plays a crucial role in shaping their impact on organizational innovation and practice adoption. Although extant literature remains inconclusive on whether normative changes foster innovation or new practices, with some studies highlighting the positive role of professional actors (Lounsbury & Crumley, 2007; Wright & Zammuto, 2013; Van Wijk et al., 2013) and others noting that forces like trade associations promote established technologies (Sine et al., 2005; Zietsma et al., 2017), we observe from the literature that normative forces influenced by specific interest groups often preserve existing practices. For example, studies by Sine et al. (2005) and Zietsma et al. (2017) show that normative forces, like trade associations, are influenced by interest groups prioritizing their own agendas over public interests. This reflects findings that professional associations often rely on these groups for legitimacy and act as gatekeepers against new standards (Greenwood, Suddaby, & Hinings, 2002; Battilana et al., 2009; Zietsma et al., 2017). We demonstrate that when normative changes are led by organizations not tied to specific interest

groups, such as environmental organizations, they are more likely to align with public interests and trigger innovation. This insight suggests a potential explanation for the contradiction by highlighting how the independence of normative forces from established interests might contribute to fostering new practices.

6.2 Practical implications

Our study highlights the crucial role of environmental organizations in the governance of environmental issues. We have shown that environmental innovation within firms is highly discretionary action, while normative forces can encourage environmental innovation by firms. Governments around the world should place greater emphasis on the role of environmental non-governmental organizations in environmental governance and promote interactions with authorities to control pollution through enhanced environmental innovation. For example, relevant government authorities could allocate more resources to address pollution incidents identified by environmental organizations, using their expertise and specialization to strengthen environmental governance.

Moreover, our finding about the negative moderating role of political connections implies that government should strengthen its supervision of the environmental responsibility of firms to ensure that they not only focus on political interests but also undertake social well-being. The government can formulate relevant regulations to regulate the behavior of firms and encourage them to fulfil their environmental responsibility. At the same time, the government should strengthen its supervision of political connections to prevent negative impacts on the environmental practices of firms. The government can also use rewards and penalties to incentivize firms to fulfil their environmental responsibility and promote their active responses to normative pressures.

Our analysis shows that symbolic and minimum responses to environmental requirements might not be the right long-term response from firms. Managers need to find a balance between long-run financial interests and environmental legitimacy.

Although environmental innovations may not provide short-term rewards, they do offer a sustainable solution to environmental issues, which is important for firms dealing with institutional change and legitimacy pressure. Managers need to recognize that appropriate internal arrangements can help the firm adapt to new norms and changing normative expectations. They can facilitate the exploitation of the capital resources of external institutional shareholders to promote long-term developments and avoid the short-term impacts of arbitrage investments. Firms that enjoy links to government should recognize that they should avoid excessive reliance on political connections and strengthen their emphasis on long-term sustainable development and social responsibility.

6.3 Limitations and directions for future research

Firstly, we show that in an empirical setting such as China, environmental organizations play an increasingly important role, enabled by digital tools (e.g., mobile phones) and affordable data science technologies that increase information dissemination and analysis of pollution data. However, the influence of environmental organizations will depend on their location; countries with less developed technological infrastructures and weak democracy and autonomy will have different organizational influences on stakeholders. We need more comparative research on the mechanisms and performance of environmental organizations in different empirical settings.

Secondly, future research could explore a more diverse set of internal stakeholders and understand which of these are able to play a critical role in the process of institutional change and how they use their resources and networks to either facilitate or impede institutional change. And a detailed analysis of how different internal stakeholders negotiate and interact with each other is also a valuable area to reveal the internal dynamics of institutional change.

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Supplemental material
Supplemental material for this article (Appendix 1, 2, and 3) is available online.

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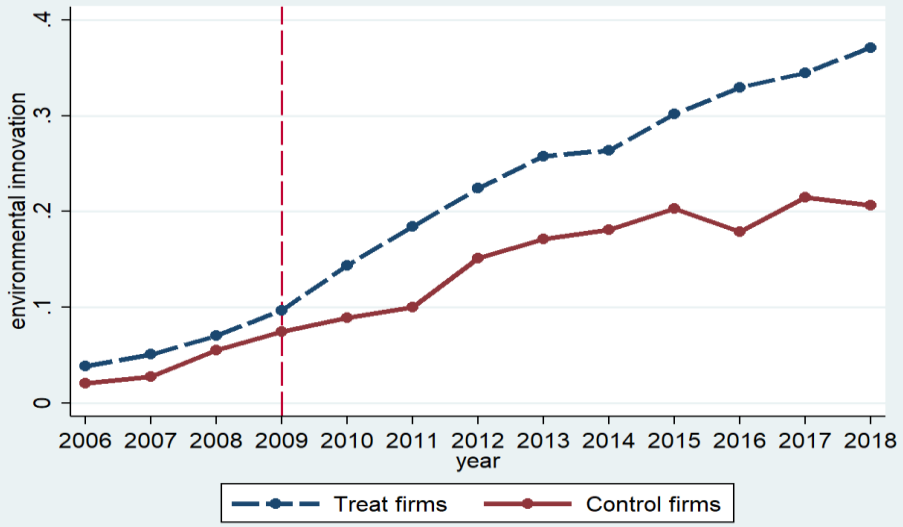
Figures and tables

Figure 1. Average change in environmental innovation between non-PITI firms and PITI firms



Note: 2006-2008 is the period before implementation of the PITI project's policy, and 2009-2018 is the period after implementation of the policy.

Table 1 Descriptive statistics

Panel A	N	Mean	Std. Dev.	Min	Max
EI (log)	25,844	0.195	0.562	0	6.662
Normative change	25,844	0.614	0.372	0	1
Political	25,844	0.522	0.469	0.000	4.728
Hold-short	25,844	0.106	0.029	0.000	0.730
Hold-long	25,844	0.009	0.014	0.000	0.291
Firm age	25,844	15.051	6.078	1.000	51.000
Firm size (log)	25,844	21.794	1.181	16.161	29.540
Firm ownership	25,844	0.454	0.478	0	1
ROA	25,844	0.039	0.067	-0.683	0.696
LEV	25,844	0.413	0.232	0.010	1.582
R&D	25,844	0.035	0.033	0.001	0.585
Independence	25,844	0.373	0.053	0.091	0.800
Mandatory disclosure	25,844	0.259	0.366	0	1
Industrial structure (%)	25,844	45.786	11.088	18.272	90.970
Per-GDP (log)	25,844	11.25	0.855	8.201	13.135
Urban pollution (log)	25,844	10.706	1.139	5.323	13.475
Unemployment rate	25,844	0.021	0.019	0.001	0.094
EFI	25,844	8.427	1.135	2.079	10.718

Panel B	Non-PITI firms (N=9664)			PITI firms (N=16180)			Difference	
	Pre-policy	Post-policy	Difference	Pre-policy	Post-policy	Difference	Pre-policy	Post-policy
	Mean (1)	Mean (2)	(2)-(1)	Mean (3)	Mean (4)	(4)-(3)	(3)-(1)	(4)-(2)
EI	0.039	0.157	0.118***	0.052	0.252	0.200***	0.013	0.095***
Political	0.767	0.583	-0.183***	0.650	0.463	-0.187***	-0.117***	-0.120***
Hold-short	0.005	0.014	0.009***	0.005	0.012	0.007***	0.000	0.002***
Hold-long	0.008	0.010	0.001**	0.008	0.009	0.002***	0.000	0.000
Firm age	10.153	16.599	6.446***	10.158	16.658	6.500***	0.005	0.059
Firm size	21.394	21.827	0.433***	21.518	21.891	0.373***	0.124***	0.064**
Firm ownership	0.392	0.393	0.001	0.351	0.351	-0.000	-0.041**	-0.042***
ROA	0.038	0.040	0.002	0.039	0.038	-0.001	0.001	-0.002
LEV	0.436	0.408	-0.027***	0.437	0.406	-0.031***	0.001	-0.002
R&D	0.041	0.033	-0.008***	0.042	0.034	-0.008***	0.001	0.001
Independence	0.364	0.371	0.007***	0.368	0.374	0.006***	0.004***	0.003***
Mandatory disclosure	0.157	0.160	0.003	0.159	0.159	0.000	0.002	-0.001
Industrial structure	48.822	48.653	-0.17	49.28	44.145	-5.136***	0.458	-4.508***
Per-GDP	9.702	10.489	0.787***	10.901	11.547	0.646***	1.199***	1.058***
Urban pollution	10.207	9.939	-0.268***	11.424	10.634	-0.790***	1.217***	0.695***
Unemployment	0.021	0.019	-0.001	0.019	0.022	0.003***	-0.002***	0.002***
EFI	7.829	8.033	0.204***	8.287	8.559	0.272***	0.459***	0.526**

Notes: *p<0.1, **p<0.05, ***p< 0.01.

Table 2 Correlation coefficients

Variables	1	2	3	4	5	6	7	8	9
1. EI									
2. Normative change	0.141								
3. Political	-0.036	-0.178							
4. Hold-short	-0.023	0.071	-0.047						
5. Hold-long	0.058	0.035	0.083	0.048					
6. Firm age	-0.092	0.349	-0.142	0.151	0.088				
7. Firm size	0.256	0.115	0.049	0.103	0.137	0.233			
8. Firm ownership	0.048	-0.017	-0.014	0.049	0.039	0.096	0.291		
9. ROA	-0.002	-0.007	0.028	-0.051	0.069	-0.062	-0.020	-0.082	
10. LEV	0.046	-0.044	0.003	0.019	-0.028	0.030	0.269	0.290	-0.249
11. R&D	0.008	-0.069	-0.028	-0.018	-0.013	-0.059	-0.132	-0.004	0.014
12. Independence	0.027	0.048	0.026	-0.008	-0.014	0.031	-0.018	-0.094	-0.036
13. Mandatory disclosure	0.144	0.001	0.025	0.036	0.050	0.039	0.427	0.325	0.053
14. Industrial structure	-0.050	-0.208	0.083	-0.042	-0.044	-0.149	-0.087	-0.006	0.011
15. Urban pollution	-0.098	-0.088	0.061	-0.103	-0.088	-0.286	-0.107	0.047	0.040
16. Per-GDP	0.130	0.389	-0.157	0.043	0.043	0.234	0.077	-0.150	0.008
17. Unemployment rate	0.017	0.057	-0.031	-0.001	0.009	0.030	0.011	-0.026	0.006
18. EFI	0.076	0.164	-0.068	0.038	0.056	0.159	0.041	-0.237	0.025
Variables	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
11. R&D	-0.014								
12. Independence	-0.031	-0.002							
13. Mandatory disclosure	0.143	-0.003	-0.026						
14. Industrial structure	0.052	-0.024	-0.052	-0.065					
15. Urban pollution	0.059	0.009	-0.072	0.010	0.283				
16. Per-GDP	-0.053	-0.030	0.101	-0.018	-0.218	-0.164			
17. Unemployment rate	0.004	0.000	-0.002	-0.013	0.081	0.031	-0.044		
18. EFI	-0.075	-0.004	0.024	-0.088	0.008	-0.131	0.376	0.025	

Notes: Coefficients are significant at $p < .05$ when absolute values are greater than 0.014.

Table 3 Regression results for testing hypotheses

	(1)	(2)	(3)	(4)	(5)	(6)
Firm age	-0.004***	-0.004***	-0.003**	-0.004***	-0.004***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm size	0.098***	0.098***	0.097***	0.098***	0.098***	0.099***
	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)
Firm ownership	0.019*	0.017*	0.018*	0.019*	0.019*	0.019*
	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.010)
ROA	0.122**	0.123**	0.121**	0.122**	0.120**	0.119**
	(0.053)	(0.054)	(0.053)	(0.052)	(0.053)	(0.051)
LEV	0.008	0.009	0.007	0.008	0.009	0.007
	(0.013)	(0.015)	(0.014)	(0.013)	(0.014)	(0.012)
R&D	0.266***	0.269***	0.270***	0.263***	0.267***	0.268***
	(0.083)	(0.084)	(0.082)	(0.081)	(0.082)	(0.084)
Independence	0.223*	0.222*	0.219*	0.223*	0.222*	0.224*
	(0.133)	(0.133)	(0.131)	(0.133)	(0.133)	(0.132)
Mandatory disclosure	0.125***	0.125***	0.124***	0.126***	0.125***	0.125***
	(0.021)	(0.021)	(0.020)	(0.023)	(0.021)	(0.022)
Industrial structure	0.001	0.003	0.003	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Urban pollution	-0.006	-0.002	-0.003	-0.003	-0.002	-0.003
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)
Per-GDP	0.091**	0.090**	0.093**	0.091**	0.088**	0.089**
	(0.036)	(0.038)	(0.040)	(0.039)	(0.036)	(0.037)
Unemployment rate	0.153	0.073	0.070	0.063	0.056	0.051
	(0.241)	(0.236)	(0.233)	(0.230)	(0.228)	(0.227)
EFI	0.006	0.005	0.005	0.005	0.005	0.005
	(0.007)	(0.005)	(0.006)	(0.007)	(0.007)	(0.006)
Political	0.005	0.005	0.015	0.006	0.010	0.016
	(0.008)	(0.007)	(0.012)	(0.013)	(0.014)	(0.015)
Hold-short	-0.340**	-0.335**	-0.332**	0.075	-0.330**	0.141
	(0.143)	(0.144)	(0.142)	(0.137)	(0.144)	(0.138)
Hold-long	0.613	0.655	0.621	0.648	1.037	1.453*
	(0.598)	(0.603)	(0.611)	(0.622)	(0.711)	(0.857)
Normative change		0.126***	0.146***	0.133***	0.112***	0.144***
		(0.022)	(0.025)	(0.023)	(0.020)	(0.024)
Normative change x Political			-0.043*			-0.051**
			(0.023)			(0.020)
Normative change x Hold-short				-0.563***		-0.639***
				(0.195)		(0.193)
Normative change x Hold-long					2.016**	2.139**
					(0.802)	(0.855)
Constants	-1.321***	-1.516***	-1.469***	-1.507***	-1.526***	-1.536***
	(0.301)	(0.317)	(0.315)	(0.313)	(0.314)	(0.309)
Year FE	YES	YES	YES	YES	YES	YES
Indus FE	YES	YES	YES	YES	YES	YES
City FE	YES	YES	YES	YES	YES	YES
N	25,844	25,844	25,844	25,844	25,844	25,844
R^2	0.203	0.204	0.204	0.205	0.205	0.206

Notes: The heteroskedasticity-robust standard errors are reported in parentheses. *p<0.1, **p<0.05, ***p< 0.01 (two-tailed).

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