NOT ALL POLITICAL TIES ARE THE SAME: FIRMS' TIES TO THE GOVERNMENT AND POLLUTION

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ABSTRACT

Complementing research on the implications of political ties for firms' strategic decisions and financial performance, recent studies are increasingly focusing on the environmental consequences of firms' political connections. We contribute to this stream of work by integrating insights from the literature on political ties and the multifaceted nature of governments to explore how the level of government influences the pollution implications of firms' political ties. Specifically, we theorize and demonstrate that, in China, firms' achieved political ties with high levels of the government reduce pollution, while such ties with low levels of the government increase it. Furthermore, we examine how these relationships are moderated by firm owners' social class and the attention by different levels of the government to their respective primary goals. Our analysis of data from 6,758 privately-owned Chinese enterprises provides support for our predictions. Our main conceptual contribution is to add more nuance to the research on political ties by highlighting the contingent role of the level of government in shaping firms' pollution outcomes.

***Keywords*:** political ties; pollution; nonmarket strategy; China

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INTRODUCTION

Political ties, personal and institutional linkages between firms and government, are ubiquitous for firms across the globe (e.g., Gao, Sun, Grosman, & Okhmatovskiy, 2021; Wei, Jia, & Bonardi, 2023). Accordingly, management researchers have extensively studied the implications of political ties for firms' strategic decisions and financial performance (e.g., Haveman, Jia, Shi, & Wang, 2017; Zheng, Singh, & Mitchell, 2015). Complementing this body of knowledge, researchers have recently also directed their attention to the environmental (e.g., Fisman & Wang, 2015) and societal (e.g., Fisman & Wang, 2015; Luo, Wang, & Zhang, 2017; Zhang, Marquis, & Qiao, 2016) implications of firms' political ties. This expansion of interest is aligned with increasing recognition of the need for responsible management research and practice to address climate change and other societal issues (e.g., Aguilera, Aragon-Correa, & Marano, 2022; Nyberg & Wright, 2022).

Separate from the work on political ties, a distinct body of research has focused on the multifaceted nature of governments (e.g., Choi, Jia, & Lu, 2014; Grandy & Hiatt, 2020; Luo et al., 2017; Wang, Wijen, & Heugens, 2018). Drawing on frameworks such as the multifaceted state influence model, this body of work highlights that, different levels of government can exert different or even conflicting influences on firms, leading to variations in outcomes, such as firms' environmental practices (Wang et al., 2018) and CSR reporting (Luo et al., 2017).

In this study, we integrate these two literatures to theorize the differential implications of political ties based on their level. We start with the insight of Zhang et al. (2016), who argue and demonstrate (in the same context as ours, China) that, on average, achieved political ties are closely linked to the binding mechanism. In developing our predictions, we also take a more indigenous approach by drawing from work on China's multi-layered government system

(e.g., Li & Lu, 2020; Luo et al., 2017; Wang et al., 2018) and the role political ties play in firms' strategic decisions and survival in China (e.g., Zhang et al., 2016; Zheng et al., 2015).

We hypothesize that achieved political ties to high-levels of the government in China are associated with less pollution by firms, relative to firms without such ties. In contrast, achieved political ties to low-levels of the government are associated with more pollution by firms, as compared to firms without such ties. These differential effects of political ties are due to the different binding pressures faced by firms with high- and low-level political ties. Further, we argue that firm owners' social class and attention by different levels of the government to their respective primary goals vary the binding pressures and thus, moderate our baseline effects. We find support for our predictions using a sample of 6,758 privately owned Chinese enterprises.

Our primary conceptual contribution is to improve the understanding of the implication of political ties for firms, particularly their polluting behaviors. Specifically, we introduce the level of political ties as a contingency factor that changes the direction of the relationship between political ties and firm pollution, rather than strengthening or weakening the effect in the same direction. Our integration of the literatures on political ties and the multifaceted nature of governments allows us to establish that the effect of political ties on firm pollution is positive for ties with certain levels of government, but negative for ties with others. While the core of our framework is that the level of government determines the direction of pressure exerted through the binding mechanism of political ties, we extend this logic by examining how factors on both sides of the government–firm owner dyad relationship shape how this mechanism/contingency operates. Specifically, government attention affects the strength of the binding pressure, while the firm owner's social class influences the firm's ability or willingness to resist it. In doing so, our predictions collectively highlight that investigations of the effect of political ties on firms' polluting behaviors are theoretically incomplete if they do not consider the level of government to which a firm has political ties, and also the social and institutional characteristics of the actors in this relationship.

Our secondary contribution is to advance indigenous theorizing (Liu, Heugens, Wijen, & van Essen, 2022). Our theorization based on characteristics of the Chinese context emphasizes the need to consider the peculiarities of the institutional context in theorizing the implications of political ties to firms. To further illustrate this, we speculate about the implications of political ties to firm pollution in Canada and Belgium, as well as provide a forward-looking discussion about China.

Our phenomenological contribution is to the growing research on corporate sustainability that details the obstacles to addressing environmental challenges (e.g., Aguilera, Aragón-Correa, Marano, & Tashman, 2021; Nyberg & Wright, 2022). As China is the second largest economy in the world and a top contributor to global greenhouse gas (GHG) emissions, our study offers valuable new insight into the need for regulatory approaches that are aligned across levels to incentivize both government officials and firm owners to effectively reduce firm pollution, and thus, address climate change.

THEORETICAL BACKGROUND

Political Ties and Social Issues

Political ties are boundary-spanning personal and institutional linkages between the firms' owners and/or top officers and various levels of the constituent parts of the government[1] (Faccio, 2006; Sun, Mellahi, & Wright, 2012; Wei et al., 2023). The level of a political tie, *tie level* from hereon for simplicity, is the level(s) of the government (i.e., low- or high-levels of government), to which the political tie connects the firm (Zheng et al., 2015).

Political ties have become a prominent topic across multiple disciplines, which have extensively examined the financial impact of political ties, especially their influence on firm performance (e.g., Haveman et al., 2017; Hillman, 2005; Zheng et al., 2015). For instance, Hillman (2005) finds that political ties enhance a firm's market-based performance, while Zheng et al. (2015) show that they enhance a firm's survival and sales growth. Further, scholars have examined how political ties shape a firm's market expansion (e.g., Frynas, Mellahi, &

Pigman, 2006; Sojli & Tham, 2017), financing strategy (e.g., Claessens, Feijen, & Laeven, 2008; Haveman et al., 2017), and innovation (e.g., Kotabe, Jiang, & Murray, 2014).

Echoing the growing attention to firms' societal and environmental impacts, political ties research has shifted beyond firm-centric implications of political ties to broader considerations. For instance, Marquis and Qian (2014) suggest that politically connected firms are more likely to engage in CSR initiatives, such as issuing CSR reports. In contrast, other studies highlight the potential social costs of political ties. For example, Fisman and Wang (2015) find that political ties increase workplace fatalities, in which the worker death rate for politically connected firms is higher than that of unconnected firms. Similarly, Heitz et al. (2023) find that political ties often lead to regulatory leniency, allowing firms to evade strict environmental compliance and pollute more. Taken together, these findings underscore the dual nature of political ties, highlighting their potential to drive both socially responsible initiatives but also adverse societal outcomes.

To explain the implications of firm political ties, scholars have invoked several theoretical mechanisms (for an overview, see Gao et al., 2021). One key mechanism particularly relevant in our context is *binding*. It highlights that political ties can constrain firms by aligning them with the agendas of political actors and compel the firms to act in politically motivated ways to maintain these ties or as a condition for receiving continued support and benefits (Liu, Yang, & Augustine, 2018; Zhang et al., 2016). In this sense, the *binding* mechanism suggests that political ties not only provide benefits but also impose constraints on connected firms as firms might be pressured to fulfill sociopolitical obligations (Marquis & Qian, 2014) or face the risk of resource appropriation by the government (Dieleman & Boddewyn, 2011). For example, studies found that firms with political ties are more likely to undertake CSR activities, in line with the expectations of the government (e.g., Li & Lu, 2020; Luo & Wang, 2021; Zhang et al., 2016), or to help politicians in their re-election efforts by creating more employment (Bertrand, Kramarz, Schoar, & Thesmar, 2018).

Despite the richness of the body of work on the implications of political ties for firms, much of the existing literature assumes a unitary government structure. For example, Marquis and Qian (2014) and Stuart and Wang (2016) operationalize political ties without explicitly distinguishing between low and high levels of government. However, research on the multitiered nature of government suggests that treating governments as unitary entities oversimplifies the complex ways in which they operate and the implications of political ties for firms are contingent on the tie level.

High-level and Low-level Government in Multi-tiered Systems

Most government systems are multi-tiered and consist of the national and various sub-national levels (e.g., the state or provincial level, the city level). This is particularly so in federal government systems, which represent about twenty-five countries and 40% of the world's population (Leland, Chattopadhyay, Maestas, & Piatak, 2021), and in countries with non-federal government systems, such as China (Wang et al., 2018). The importance of accounting for the multi-tiered nature of governments has been acknowledged in political science (e.g., Rodden & Wibbels, 2002), economics (e.g., Montinola, Qian, & Weingast, 1995), and more recently, in management (e.g., Choi et al., 2014; Grandy & Hiatt, 2020; Wang et al., 2018).

A multi-tiered government system generally entails differences across government levels in aspects such as roles and responsibilities, goals and priorities, and the distribution of power (e.g., Qian & Roland, 1998; Trounstine, 2009; Wang et al., 2018). Specifically, national governments typically establish overarching regulatory frameworks, set economic and industrial policies, and enforce compliance through taxation, subsidies, or sanctions while lower levels of government assume a more implementation role (Choi et al., 2014; Grandy & Hiatt, 2020; Wang et al., 2018). Additionally, high-levels of the government often pursue broader, longer-term goals, while low-levels of the government pursue more specific and shorter-term goals, aimed at local needs (Prud'homme, 1995; Wang, Hong, Kafouros, & Wright, 2012). Further, higher levels of government often have greater power to advance their

agendas through policy-setting, enforcement, and other means of leverage over firms, while lower levels of government use local permitting and targeted incentives to shape firms' behavior (Grandy & Hiatt, 2020).

As we will elaborate next, particularly for environmental issues that we focus on, these generally observed distinctions between high- and low-level governments largely mirror the situation in China, shaping the implications of political ties for firms and society.

Political Ties and the Multitiered Government in China

Paralleling the broader research on political ties and the multifaceted nature of governments, scholars have developed two indigenous models to understand the influence of the state on Chinese firms' sustainability/CSR strategies: the political dependence model and the multifaceted state influence model (Liu et al., 2022 for a review).

The political dependence model focuses on the impact of political ties and highlights that Chinese firms' dependence on the government influences their engagement in socio-environmental actions. This literature highlights how firms make CSR or sustainability decisions to address the government's societal and environmental expectations; and how these decisions are influenced by the presence and the type of political ties they have with the government (Ji, Huang, & Li, 2021; Jia & Zhang, 2013; Marquis & Qian, 2014; Zhang et al., 2016). However, research using this model has not systematically examined whether the impact of political dependence through political ties might vary across different levels of government.

The multifaceted state influence model emphasizes the conflicting demands on firms that stem from different levels of the government in China, and notes that Chinese firms' engagement in social and environmental development diverges when such demands differ (e.g., Li & Lu, 2020; Luo et al., 2017; Wang & Luo, 2019). For example, Luo et al. (2017) found that large firms with national institutional linkages are likely to issue CSR reports swiftly and with higher quality, while opposite CSR reporting strategies are observed when the provincial government prioritizes Gross Domestic Product (GDP) growth. In other words, research

adopting the multifaceted model recognized the differentiated impacts of different levels of the government on Chinese firms but it also has not considered whether *political ties* to different levels of the government might lead to different outcomes.

In light of this summary of these streams of work, we will build on the insights of both indigenous models to elaborate on how low- and high-levels of the government differ in China with regard to environmental issues.

Environmental Regulation in the Multi-tiered Government System of China

There are clear differences between low- and high-levels of the government in China's multi-tiered government system (e.g., Li & Lu, 2020; Luo et al., 2017; Wang et al., 2018),[2] with a regionally decentralized administrative and economic system, and a highly centralized political system at the national level (Montinola et al., 1995; Xu, 2011). These differences are also reflected in environmental regulations and their implementation.

Relative to low-levels of the government, high-levels of government (e.g., the national and provincial governments) maintain more authority, especially over the design of laws, legislations, and rules (Landry, 2008; Wang et al., 2018). High-level government also sets out long-term goals and priorities in the interest of China (Li & Lu, 2020). The Chinese national government has made environmental issues one of its key long-term priorities[3] and committed substantial resources for green initiatives. For example, former Premier Wen Jiabao famously warned that the Chinese economy was becoming increasingly unstable, unbalanced, uncoordinated, and unsustainable, and emphasized the importance of environmental protection for China's future development. In 2008, the National Environmental Protection Agency was promoted to the highest level of government in the Chinese political structure and made part of the Ministry of Environmental Protection (MEP). Across our sample years (2008-2014), high-levels of government dedicated substantial, and annually increasing, attention to environmental issues in their annual reports (e.g., Wang et al., 2018).[4]

In contrast, the authority of low-levels of the government (e.g., city and township

governments) is limited to their jurisdictions and is focused on implementing and enforcing the legislation set by the high-level government. Nevertheless, this function leaves leeway for low-level government officials to decide what areas to focus on for enforcement, how much, and on whom. Such decisions may partly be driven by the political ambitions of local leaders. Political promotions in China are based primarily on how well local government leaders achieve economic and fiscal targets (Li & Zhou, 2005). Hence, the career prospects of government officials at lower levels are bolstered by meeting economic targets (Li & Zhou, 2005; Li, Liu, Weng, & Zhou, 2019; Marquis, Zhang, & Zhou, 2011). These incentives generated competition for economic growth, prompting local government leaders to turn a blind eye to pollution, if doing so helped improve economic performance (Marquis et al., 2011).

To shed light on the differences between low- and high-levels of government in China, we interviewed nine business leaders and government officials.[5] Confirming the discussion above, a government official in the Environmental Protection Bureau in China noted that high-levels of government prioritize environmental goals:

> "*The national government has paid significant attention to environmental protection in recent years. The national government emphasizes ecological civilization and sustainable development and highlights that 'clear waters and green mountains are as valuable as mountains of gold and silver' (lüshui qingshan jiushi jinshan yinshan). As a government official working in environmental protection in China, I can clearly feel the increasing attention on environmental issues by the national government*."

A senior manager with ties to high-level government contrasted these goals with those of low-levels of government:

> "*City or county-level governments have high pressures for economic development. Therefore, if they strictly follow [environmental] demands from the national government, it may compromise the local economy*."

One high-level government official pointed out that high-levels of the government have

considerably more authority and power, while low-levels of government are more focused on implementation:

> "*In terms of environmental governance, the national and provincial governments are mainly focused on environmental regulations and overall goals. City-level or county level governments are mainly focused on implementation."*

Building on this heterogeneity in the roles, goals, and power and authority across different levels of the government in China, we propose that the effect of political ties on firm pollution depends on whether those ties are to the high- or low-levels of the government, and that such effects are moderated by the firm owner's social class and government attention to primary goals.

HYPOTHESES DEVELOPMENT

To develop our theory, we build on the influential work of Zhang et al. (2016), who argued and demonstrated - in the same context as ours - that achieved ties, which are cultivated through deliberate efforts and accomplishments (e.g., such as an executive's political appointment to prestigious state organs), are closely linked to the binding mechanism. Accordingly, we will build our theory by focusing on how achieved political ties influence firms' polluting behavior through the binding mechanism.

High-level Achieved Political Ties and Firms' Pollution

In line with the binding function of achieved political ties (Zhang et al. (2016), firms with high-level achieved political ties may face greater obligations by being compelled to align with the sociopolitical goals set by the high-level government (Luo et al., 2017; Marquis & Qian, 2014). In China, environmental sustainability has been a key national priority, as highlighted in the government's long-term strategic plans. For example, the 12th Five-Year Plan (2011) explicitly emphasized green development as a national objective. Accordingly, firms with achieved political ties to high-levels of government are likely to be under stronger pressure to uphold national priorities and duties (Zhang et al., 2016), such as environmental sustainability.

One of our interviewees, who also serves as a delegate at the National People's Congress, reinforced this point, saying:

> "*Companies with connections to higher-level of government face more environmental pressures from the government. In addition, the higher the level of the People's Congress the delegates (business leaders) are at, the more they care about their personal reputation and political identity, while it is less salient for the lower-level delegates".*

The binding function of high-level achieved political ties is likely to pressure firms with such ties to act in ways that align more closely with the environmental goals of the high-level government, as compared to firms that have no such political ties. Therefore, we propose:

> ***Hypothesis 1.*** *Firms whose owners have high-level achieved political ties pollute less than firms whose owners do not have high-level achieved political ties.*

Low-level Achieved Political Ties and Firms' Pollution

Although low-levels of the government serve as representatives of the high level, including on matters about the environment, low-levels of government in China nevertheless have discretion, and their goals are not necessarily fully aligned with those of high-levels of the government (e.g., Luo et al., 2017; Wang et al., 2018). Thus, to increase their promotion or re-election chances, officials at low-levels of government may favor pursuing economic goals, rather than reducing pollution, which generally has less-direct implications for the local region, at least in the short-term. For example, a government leader we interviewed observed:

> *"Some firms are seeking to develop a good relationship with low-level government, so as to be able to manufacture there. Such a political relationship can be seen as a mutual collaboration between the firm and the government. At the same time, firms can also help the low-level government to realize their economic goals or get promoted."*

Accordingly, firms with ties to low levels of government might be co-opted to pursue economic goals that benefit government officials at these levels, which might create more pollution as an externality or as an unintended consequence, compared to firms that do not have

such ties. Hence, we propose:

Hypothesis 2. *Firms whose owners have low-level achieved political ties pollute more than firms whose owners do not have low-level achieved political ties.*

In deriving H1 and H2, we outlined that both the high- and low-levels of the government have the incentives and ability to bind firms that are connected to them. However, the strength of these incentives and abilities—and, consequently, the relationships we hypothesized—are likely to vary under certain conditions. We explore this by two moderators, i.e. firm owner's social class and the attention that different levels of the government give to their primary goals.

Firm Owner's Social Class

While achieved political ties influence firms' pollution behavior through a binding mechanism, how firms respond can be contingent on the attributes of the person who has that tie (i.e., firm owner). We develop this direction via the owner's social class –relative socioeconomic rank in society (Rivera & Tilcsik, 2016). Insofar as different social classes occupy distinct socioeconomic contexts (Loignon & Woehr, 2018), social class influences cognitions and actions of managers (Bapuji, Patel, Ertug, & Allen, 2020; Côté, 2011; Kish-Gephart, Moergen, Tilton, & Gray, 2022; Loignon & Woehr, 2018), as well as on how others relate to individuals and respond to their actions (Loignon & Kodydek, 2022; Pitesa & Pillutla, 2019).

As an emerging economy, China has undergone a profound economic and social transition, which has reshaped the structure and dynamics of social class (Hong, 2004; Su, Wang, & Chang, 2022). Unlike in developed economies with relatively stable class systems, where market factors (e.g., economic capital) is often the dominant determinant of social position, class in China is shaped by a combination of market and institutional factors. As such, social class in China is not only shaped by wealth accumulation through entrepreneurial activity and integration into global markets, but also through access to high-level education and participation in elite networks (Li, Wei, Cao, & Chen, 2022; Su et al., 2022). These dynamics

make social class a theoretically meaningful and empirically relevant moderator of how political ties are perceived and leveraged in relation to environmental outcomes.

Owner's Social Class and Binding of High-level Achieved Political Ties. We expect the binding effect of high-level achieved political ties to be more prominent for firm owners of higher social class, because these owners face greater moral pressures and a sense of duty, compared to owners of lower social class (George, Dahlander, Graffin, & Sim, 2016a; Graffin, Bundy, Porac, Wade, & Quinn, 2013). Firm owners of higher social class, as role models in the eyes of the government and the public, may be motivated to maintain their standing in society by acting in consonance with high-level government expectations, which emerge from their high-level achieved political ties. They are also more likely to face additional pressures because the high-level government perceives them to be resourceful and capable, expecting them to take the lead in sacrificing growth and profit to reduce pollution. Thus, noncompliance may upset their government connections and cause these relationships to weaken or dissolve (Li et al., 2022; Liu, Dai, Liao, & Wei, 2021b).

For us to observe a stronger binding effect, in addition to the higher incentives described above, high-level governments should also have the power and authority to effectively bind high-social-class owners. To this point, high-levels of the government in China possess the institutional power to enforce compliance through formal policies, regulatory scrutiny, and reputational mechanisms. Given their broad jurisdiction and authority, higher levels of government can make use of regulatory agencies, state-owned financial institutions, and high-profile national campaigns to pressure high-social-class firm owners into aligning with environmental priorities. Such firm owners, due to their visibility and standing, have more at stake in maintaining their reputation and political relationships, making them particularly susceptible to government coercion. For instance, Lei Jun, the founder of Xiaomi, a leading technology company, and a national delegate, has faced growing pressure from the high-level government in recent years to pursue green goals.[6] As a result, Xiaomi has expanded into the

electric vehicle industry, a sector heavily promoted by the government's sustainability agenda, and pledged to achieve carbon neutrality by 2040. All in all, we expect that the binding effect of high-level achieved political ties on reducing pollution will be stronger for firms with owners of a higher social class than for those whose owners are of lower social class. Therefore, we propose:

> ***Hypothesis 3.*** *The social class of the firm owner strengthens the relationship in Hypothesis 1, such that the negative relationship between high-level achieved political ties and pollution is stronger (i.e., more negative) for owners from higher social class than for owners from lower social class.*

Owner's Social Class and Binding of Low-level Achieved Political Ties. We expect that the binding pressures of low-level achieved political ties, which prompt firm owners to prioritize economic growth – with shorter-term and more direct benefits for the local level – over green behavior, will be lower for firm owners of higher social class. We expect this due to stronger societal expectations for higher social class owners to be more responsible (pushing them to resist the de-prioritization of environmental issues owing to binding pressures of low-level achieved political ties), as compared such pressures on their lower social class counterparts (Liu et al., 2021b). Firm owners of higher social class are also more likely to resist the binding pressures from low-level achieved political ties for fear of inviting scrutiny and disapproval from the high levels of the government, which hampers their aspirations and wishes to emerge as leaders (Dalton, Ghosal, & Mani, 2016; Loignon & Kodydek, 2022). Furthermore, while low levels of government indeed have avenues to bind firms to their agenda of economic growth in general, these might ultimately be inadequate - unlike the power of the high levels of government - to effectively bind high-social-class owners, who can bring to bear ways to resist due to their social position. Taking these considerations together, the implications of binding pressures for low-level achieved political ties, i.e., to prioritize economic growth at the cost of the environment, are likely to be weaker for firm owners of higher social class as

compared to firm owners of lower social class.

Hypothesis 4: *The social class of the firm owner weakens the relationship in Hypothesis 2, such that the positive relationship between low-level achieved political ties and pollution is weaker (i.e., less positive) for owners from higher social class than for owners from lower social class.*

Government Attention to Their Primary Goals

Although the high- and low-levels of the government have distinct goals and priorities in China (Wang et al., 2018), there can be variation in how much attention these levels devote to their priorities at a given point in time. Accordingly, we investigate how governmental attention to their primary goals – environment for high-level government and economy for low-level government – moderates our baseline predictions.

High-level Government's Attention to Environmental Issues and Binding via High-level Political Ties. High-level government leaders need to allocate their attention across multiple competing priorities. Given their bounded rationality (Cyert & March, 1963; Simon, 1997), they are likely to vary in how much they emphasize environmental issues. When high-level government leaders devote greater attention to environmental concerns, binding pressures on firm owners with political ties become more pronounced and salient compelling them to act, as compared to when they receive less attention.

One factor that can influence high-level government attention to environmental issues is the incidence of environmental accidents within their jurisdiction. More environmental accidents increase governmental focus on environmental regulation and heighten public scrutiny and pressure for stronger enforcement (e.g., Marquis & Bird, 2018). Therefore, we expect that when there are more environmental accidents, high-level governments are more likely to coerce politically connected firms into pollution reduction efforts, as compared to when such incidents are fewer. Accordingly, we hypothesize:

Hypothesis 5: *High-level government's attention to environmental issues*

strengthens the relationship in Hypothesis 1, such that the negative relationship between high-level achieved political ties and pollution is stronger (i.e., more negative) when environmental accidents are more frequent than when they are less frequent.

Low-level Government's Attention to Economic Issues and Binding via Low-level Achieved Political Ties. Low levels of the government also need to allocate their limited attention across multiple priorities, including economic growth. Here too, bounded rationality (Simon, 1997) suggests that low-level governments face constraints in how much attention they can devote to their primary economic objectives at a given point in time. But, when they focus more on economic growth, they are more likely to bind firms into economic activities that may lead to higher pollution levels.

A key factor shaping the attention of low-level governments is their GDP growth targets. Especially in regions where these targets are set high, low-level government officials experience mounting pressure to prioritize economic expansion over non-economic goals, such as environmental protection (Luo et al., 2017). In these cases, achieving economic benchmarks becomes a dominant concern, potentially leading officials to overlook or deprioritize environmental enforcement (Li & Zhou, 2005). Accordingly, when GDP growth targets are high, low-level governments will more strongly bind firms through achieved political ties to prioritize economic activities—potentially increasing pollution—compared to when these targets are lower. Therefore, we hypothesize:

Hypothesis 6: *Low-level government's attention to economic issues due to higher GDP growth targets strengthens the relationship in Hypothesis 2, such that the positive relationship between low-level achieved political ties and pollution is stronger (i.e., more positive) for low-level governments that focus more on economic issues than those that focus less on such issues.*

RESEARCH DESIGN

Data Collection and Sample

Our primary source of data to test our hypotheses is the *National Survey of Chinese Privately Owned Enterprises*, which has been used in past research on non-market strategies (e.g., Ji et al., 2021; Jia, 2014; Jia & Mayer, 2017; Marquis & Qiao, 2020) and on pollution (e.g., Zhang, 2019). This survey has been conducted every two years since 1991 and covers a multistage stratified random sample of privately owned enterprises across all industries and provinces in China (Jia & Mayer, 2017). The data are obtained through structured interviews with owners of private firms who have knowledge of the company since its establishment. The responses are subsequently anonymized.

Since the survey started providing information on pollution only in 2008, and because the survey data are not available to researchers after 2014, we limit our sample to the 2008, 2010, 2012 and 2014 waves. While state ownership and political connections play separate roles in strategic management (e.g., Tihanyi, Aguilera, Heugens, van Essen, Sauerwald, Duran et al., 2019), empirically isolating their effects is challenging. Therefore, we restrict our sample to fully privately-owned firms, i.e., firms that do not have state ownership, to minimize the possibility that our findings are driven by state ownership influences.

We supplemented the survey data with archival data from other sources, such as the China Environmental Yearbook, National Economic Research Institute (NERI) Report, and Baidu Baike (a large data source covering Chinese political leaders). After applying the above filters for ownership and survey waves, and excluding observations with missing data, we have a pooled cross-sectional estimation sample of 6,758 observations of fully privately-owned firms. Of these observations, 38.64% had either low-level or high-level achieved political ties. In contrast, only 12.96% of firm owners possessed ascribed ties. The vast majority of such ties (11.87%) were at the township level, with another 0.64% being at the county level. Ascribed ties were rare at higher levels (0.46% at the city, province, and national levels). This contrast between the prevalence of achieved and ascribed ties underscores the importance of achieved

ties for fully privately-owned firms, as they are significantly more widespread and likely more influential in shaping firms' polluting behavior.

The Chinese context and our data are suitable to study the effects of political ties on firms' polluting behavior. First, a considerable number of studies on political ties have been set in China and established it as a suitable context to study such ties (e.g., Zhang et al., 2016). As directly relevant to our research question, China has a political system with a multi-level hierarchical structure (Xu, 2011), and the survey we use provides information about the level of owners' political ties. Second, China's sophisticated pollution levy system (which we detail below) and China's position as one of the world's main industrial engines, with pervading levels of pollution that accompany this, make it a suitable and relevant setting to study pollution related matters (e.g., Lin, 2013).

Dependent Variable

China has a sophisticated and extensive pollution levying system (Wang & Wheeler, 2000). Here we provide information on the aspects of this system that are most directly relevant for our dependent variable, providing additional details in Online Appendix A.

The levy system is developed and supervised by the MEP[7] and enforced by local branches of this agency. This system requires firms to accurately disclose how much they pollute. Firm disclosures are checked in several ways and firms face penalties for false reporting and/or non-cooperation with inspections. The guideline for the *National Survey of Chinese Privately Owned Enterprises* highlights that the survey data was collected by a pre-trained investigator through direct interviews with the major owner of each private firm. Respondents cannot complete the questionnaire on their own, and have to respond to survey questions under the guidance of this investigator. After the initial data collection, there is a supervisor at each city/county level, who serves as a *gatekeeper* to check the quality of the collected data (Online Appendix A provides more details about data collection and quality assurance). In brief, the dataset was assembled by specialized national project teams. To assess

the assertions about the data collection procedure and checks/quality assurance, we interviewed several government officials, including those who were from a local environmental enforcement department. In these interviews, it was communicated to us that all firms' pollution monitoring systems are subject to regular, often weekly, inspections by local environmental agencies, and that noncompliance (e.g., tampering with pollution records) is a criminal offense (detailed records of these interviews are available upon request). These data collection and levy systems, as well as the checks in place, limit fraud and other manipulation and provide reassurance that the data are reliable. The suitability of this dataset for research purposes that are similar to ours is also evidenced by the previous studies that used it (e.g., Ang & Jia, 2014; Ji et al., 2021; Jia, 2014; Marquis & Qiao, 2020).

Based on their disclosures, firms are charged a levy by the MEP depending on how much their emissions exceed the minimum pollution threshold set in Regulations on the Administration of the Collection and Use of Pollutant Discharge Fees. Hence, the levy system applies to emissions that fall within legally permitted levels, with the result that the levy works as a tax-like compensation and does not function as a penalty for illegal emissions.[8] A firm might not be paying any levies because it did not emit any regulated pollutants at all, or because it emitted a level of these pollutants that did not exceed the threshold for levies to be imposed.

In general, the pollution levies that firms are charged are considered to be an accurate, albeit imperfect, indicator of firms' actual pollution. Accordingly, and in line with previous work on pollution in China (Ding, Jia, Wu, & Yuan, 2016; Du, 2015; Maung, Wilson, & Tang, 2016; Zhang, 2019), we used the amount of pollution levy that firms are charged by the MEP as a proxy for their pollution intensity. We measured *Pollution intensity* as the natural logarithm of one plus pollution fees per 10,000 RMB (approximately 1,420 USD) of total sales revenue (Zhang, 2019). After presenting our main results, we detail how they are robust to different specifications of the dependent variable, including an untransformed specification.

While there are clear merits to our measure (for example, unlike measures based on a single pollutant, e.g., carbon dioxide or sulfur dioxide, it captures emissions based on a range of pollutants, and is available for small, medium, and large firms), it has limitations. In particular, our measure is based on self-reported (albeit carefully verified) emissions and is an indirect proxy of firms' actual pollution levels. Accordingly, to increase confidence in the suitability of this measure for our purposes, we ascertained the validity of the pollution levy using the following approaches:

First, the three MEP officials we interviewed expressed confidence that the data provided by firms are accurate and that the levy imposed on firms reflects actual pollution levels. In the words of one official: "pollution levy clearly reflects the level of pollution by firms because it is calculated based on the level of pollution directly emitted to the environment."

Second, while this database is anonymized, which prevents us from constructing an alternative dependent variable, we use two other datasets to investigate the validity of using levies paid as a proxy of emissions. In particular, the *Annual Census on Industrial Enterprises* dataset (ACIE) contains data on pollution levies and firm identifiers, which allows us to merge it with the *Environmental Survey and Reporting* (ESR) database, which provides information about industrial firms' actual emissions.[9] Merging these two databases allows us to assess the validity of using the levies paid by a firm as a proxy of its actual emissions, by looking at their correlation. We used the ESR database to develop a composite emission index for 12,952 industrial firms in 2014 (the only year for which data from both ACIE and ESR are available) by standardizing each type of emissions in the database (i.e., sulfur dioxide, chemical oxygen demand, smoke dust, and industrial dust) and summing them. While this measure of emissions is restricted in that it reflects a selected set of pollutants and does not have the sophistication as the formula used to calculate the levy in the database for our main analysis, it provides a reasonable indication of firms' actual emissions. The Pearson correlation of this index with the levies paid by these same firms (from ACIE) is 0.60 ($p < 0.001$). This association provides

evidence for the suitability of using the levies a firm pays as a suitable proxy for that firm's actual emissions.

Independent Variables

High and low-level achieved political ties. China's administrative system consists of five levels with political representative power, which are (in descending order): the national-level, the provincial-level (typically provinces and autonomous regions), the prefectural-level (typically cities), the county level (typically districts), and the township-level (typically rural towns or sub-districts) (Li & Zhou, 2005). The survey we use provides information on owners' political ties to each of these levels. An owner is considered to have a political tie to a given administrative level if the owner is serving as a delegate in either the People's Congress (PC) or the Chinese People's Political Consultative Conference (CPPCC) at that particular level (e.g., Zhang et al., 2016). Hence, our measure is in line with what Zhang et al. (2016) refer to as achieved political ties.[10] Based on this information, we construct two dichotomous measures: The first measure, labeled *Low-level achieved political ties*, is coded as 1 if an owner has a political tie at the prefectural, county, or township level, and 0 otherwise. The second measure, labeled *High-level achieved political ties*, equals 1 if an owner has a political tie at the provincial or national level, and 0 otherwise. In 44 cases (0.65% of total observations) a firm had both high-level and low-level achieved ties. For these rare dual level cases, we used the highest level in categorizing the level of political ties of the focal firm. We check the robustness of our findings to this choice by using three other alternative approaches, which we discuss in the robustness section and Online Appendix B.

The decision about how to categorize high-level and low-level achieved ties depends on a study's context and purpose. We rely on existing work that has characterized the multi-tiered government system in China, and China's environmental governance context to determine where to split between high-level and low-level achieved ties. As we discussed earlier, the national government and autonomous regions maintain authority over the design of laws,

legislations, and rules, and also set long-term goals and priorities, which emphasize environmental protection. Provincial government leaders directly report to and are evaluated by the national-level government, which further aligns these two high levels (Xu, 2011). In contrast, the prefectural, county and township governments are, for example, responsible for administrative matters and the implementation and enforcement of high-level legislation within their jurisdictions (e.g., Haveman et al., 2017; Xu, 2011). Politicians at these levels are rewarded primarily for meeting economic targets set by the high-level government, which can make it in their interest to overlook environmental pollution (e.g., Marquis et al., 2011), especially when doing so might yield economic growth. These systematic differences between the levels of government in China map onto the classification we use.[11] Our cross-check of official government websites[12] and interviews with several government officials also suggests that this classification is tenable. For example, one informant noted that "the actual implementation of environmental regulation is generally from the city-level government and below." This discussion notwithstanding, we also check the sensitivity of our findings to this particular split using two alternative approaches, which we detail in the robustness checks.

Moderating Variables

Owner's social class. Social class is commonly captured using the MacArthur Ladder Scale, which involves asking individuals to place themselves, relative to others, on a ladder with 10 rungs (Adler, Epel, Castellazzo, & Ickovics, 2000; Piff, 2013). In the survey we use, owners were asked to position themselves on three different ladders, indicating social, economic, and political dimensions of the societal ladder (1 for the highest and 10 for the lowest). To facilitate interpretation, we reverse-coded the original data, such that 1 indicates the lowest level and 10 indicates the highest level. In computing our measure, we included the scores for the social and economic ladders, because social class is defined as one's relative socioeconomic rank in society (Rivera & Tilcsik, 2016: 1097). As the social and economic dimensions of social class are conceptually (e.g., Loignon & Woehr, 2018) and empirically

related (Cronbach α = 0.89), we calculated the average scores of social and economic ladders, and then standardized these scores to derive a composite measure of an owner's *Social class*.

High-level government's attention to environmental issues. To quantify high-level government's attention to environmental issues, we draw on insights from spatial econometrics and management research (e.g., Simons, Vermeulen, & Knoben, 2016) to construct an index. We rely on prior research showing that attention to environmental issues is driven by the incidence of environmental accidents (e.g., Barnett & King, 2008), and use data from the *China Environmental Yearbook*, published by MEP, to measure these accidents.

Specifically, we adapt the measure proposed by Simons et al. (2016), which reflects that environmental accidents in nearby regions attract more attention than those occurring farther away. Following their approach, we incorporate an exponential distance decay function (e.g., Doh & Hahn, 2007) to account for this effect.[13] Our index is formulated as follows:

$$HEA_{it} = \sum_{j} \frac{EA_{jt}}{d_{ij}^2}$$

where *i* refers to the province where the focal firm is located, *j* refers to the provinces in which accidents occurred, EA_{jt} refers to the total number of environmental accidents in *j* province at time *t*, and d_{ij} refers to the geographic distance between the province in which accidents occurred and the province where the focal firm is located.[14]

Overall, this index captures the environmental accidents in all provinces in China, including the province in which the focal firm is located, and adjusts for the effect of such accidents to decay as a function of the geographic distance between the province in which the accidents occurred and the province of the focal firm. We label this variable *High-level environmental attention,* with higher values indicating greater attention from high-level governments to environmental issues.

Low-level government's attention to economic issues. To measure low-level government attention to economic issues, we draw from work that highlights that low-level

governments' GDP growth targets shape their attention to economic issues (e.g., Luo et al., 2017).[15] Specifically, we use the annual work reports of prefectural-level governments to collect the low-level GDP growth target (in %). We label this variable *Low-Level Economic Attention*, with higher values indicating greater attention from low-level governments to economic issues.

All three moderators are standardized to facilitate the interpretation of the interaction effects and their graphical representations.

Control Variables

We controlled for a range of factors that could influence firms' pollution intensity. First, we control for the characteristics of the firm's owner. We control for the *Owner's gender*, using an indicator variable that is 1 if the owner is male and 0 if the owner is female (Zhang, 2019) and *Owner's age,* measured in years. We use an ordinal variable to capture the *Owner's education* (1 = primary school or below, 2 = middle school, 3 = high school, 4 = higher vocational education, 5 = undergraduate university degree, 6 = postgraduate university degree). We control for the *Owner's international experience* using an indicator variable that is 1 if the owner studied or worked abroad and 0 otherwise. We use another indicator variable, labelled *Owner's government experience,* to capture whether an owner has previously held a position in government, to control for the effect of ascribed political ties identified by Zhang et al. (2016).

Second, we control for firm characteristics that might impact pollution intensity. As larger or older firms might be less susceptible to institutional and government pressures (Berrone, Cruz, Gomez-Mejia, & Larraza-Kintana, 2010), which might in turn affect their pollution intensity, we control for *Firm size*, using the natural logarithm of the number of employees, and *Firm age* (i.e., years since founding). Because firms' financial performance might affect their environmental performance (e.g., Berrone et al., 2010; Flammer, 2012), we control for *Financial performance*, using return on assets. We also control for the firm's *Leverage,* measured as the debt-to-assets ratio, as an indicator of the availability of resources to

undertake environmental investments. Finally, we control for firms' *Productivity*, using sales-per-employee ratio. In line with common research practices (e.g., Blankespoor, 2019; Schwert, 2020), we winsorized accounting and financial measures at the 1% and 99% levels.[16]

Third, we controlled for province-level factors to account for regional differences that might influence a firm's pollution intensity. We control for differences in *Institutional development* using a measure based on the Marketization Index that is extracted from the National Economic Research Institute (NERI) report (Wang, Fan, & Yu, 2017). We also capture differences in *Corruption* using the number of corruption cases per 10,000 civil servants in a province (Liu, Sheng, Shu, & Zhao, 2021a). To control for differences across provinces in efforts to protect the environment, we use the total amount of environment-related investments divided by the GDP of a province in a year and label this variable *Environmental investment.* Since they can impact firms' pollution levels (e.g., Wang & Wheeler, 2005; Wang et al., 2018), we use two measures to capture differences in the effectiveness of environmental regulation: the ratio of the number of officials in the environmental monitoring and inspection agencies to the number of industrial firms in a province, which we label *Enforcement inspection,* and the ratio of the total number of pollution penalty cases to the number of firms that discharge pollutants in a province, which we label *Enforcement penalty.* Together, these five control variables capture variation across provinces in reporting accuracy, environmental enforcement, and potential corruption that might impact our proposed relationships. We also control for *GDP growth* to capture the dynamic economic conditions in a province. In addition, to proxy for other time-varying unobserved regional factors (as we note later, our models include province-fixed effects to account for heterogeneity across provinces that does not vary within our sample period) that might contribute to a firm's pollution intensity, we control for a province's level of *Waste water pollution* (measured as the discharge volume in 100 million tons) and *Waste gas pollution* (measured as the gas emissions in trillion cubic meters).

Fourth, we control for factors related to political leaders that might affect firms' pollution

intensity. We start with controlling for the government's effort to mitigate pollution. To do this, we used Chen, Kahn, Liu, and Wang's (2018) "government effort" measures, adapting them to capture the high and low levels of the government separately. We conducted a content analysis of the annual reports of various levels of the government. In each report, we selected all sentences that contained any of the environment-related terms identified by Chen et al. (2018), and calculated the ratio of the words in environment-related sentences to the total words in that year's report. Using that information, we calculated two measures: *Low-level environmental effort* is based on reports at low-level government (up to the prefecture level), and *High-level environmental effort* is based on reports at high-level government (from the province level upward). We also control for government leaders' career horizons, by identifying the two most senior officials at each level of the government (e.g., the mayor and party secretary at the prefectural level), calculating the number of years each is from the official retirement age, and then averaging these values to arrive at a measure of *Low-level political leaders' career horizons* as well as a separate measure for *High-level political leaders' career horizons.*[17] Because changes in the government leadership might create political uncertainty, which might affect firms' pollution activities, we control for whether there has been a turnover in leadership. Specifically, *Low-level political leaders' change* is an indicator variable that is 1 if any of the most senior political leaders at low levels of government left their position in the focal year, and 0 otherwise. Paralleling this we also construct an indicator variable for *High-level political leaders' change*. Finally, in addition to including low-level economic attention in our models as a moderator, we control for *High-level economic attention* by taking the average value of national-level GDP targets and province-level GDP targets, capturing high-level government attention to economic issues.

To account for possible heterogeneity across years, industries, and provinces, our models include year fixed effects, province fixed effects, and industry fixed effects. All control variables are lagged by one year.

Estimation Approach

Our dependent variable is left-censored at zero, i.e., when an observation takes the value of the lower limit, this might mean that the firm has not emitted any regulated pollutants, or it might mean that the firm has emitted some regulated pollutants but that the levels of these emissions are below the threshold for levies to be imposed. In both cases, the observation is reported to have a lower limit value of zero, despite the fact that the two cases are qualitatively different. Not incorporating this censoring into our analyses might lead to inconsistent estimators (Greene, 2012: 851). Thus, we use Tobit regression models, which account for such censoring, to estimate our coefficients. We also estimated the model using Ordinary Least Square Regression (OLS) which yielded consistent results, as detailed in the robustness section.

To account for possible heteroskedasticity and lack of normality in the error terms, we use robust standard errors (Greene, 2012). We note the robustness of our findings to other estimation approaches, such as different specifications of fixed effects (including prefecture-level fixed effects and time-varying industry fixed effects), in the robustness section. In that section, we also explore potential endogeneity issues.

RESULTS

Table 1 provides the descriptive statistics and the correlation matrix, and Table 2 presents the results of the Tobit regression models. Model 1 is the baseline model with control variables. In Models 2 and 3, we introduce our explanatory variables separately, and together in Model 4. In Models 5 through 8, we introduce the interaction terms separately, and in Model 9 we include all four interactions together.

Insert Tables 1 and 2 here

Several of the control variables are worth discussing (Table 2, Model 4). Firms with higher financial performance also have higher levels of pollution intensity ($p = 0.028$), which

might suggest that in our setting firms benefit economically from polluting. There is a positive and significant ($p < 0.001$) association between the level of regional corruption and our dependent variable. If the levy system were prone to being influenced by systematic corruption, we might expect that firms would pay *lower* pollution levies in regions with higher corruption. This does not appear to be the case, since the association we observe is the opposite.

Consistent with Hypothesis 1, we find in Model 4 that *High-level achieved political ties* are negatively related to pollution intensity ($\beta = -0.488$, $p = 0.023$). Conversely, we observe a positive and significant association between *Low-level achieved political ties* and our dependent variable ($\beta = 0.373$, $p < 0.001$ in Model 4), in line with Hypothesis 2. Regarding effect size, having *High-level achieved political ties* (as compared to not having them) is associated with levels of firm pollution that are a third of a standard deviation lower, while having *Low-level achieved political ties* (compared to not having such ties) is associated with levels of firm pollution that are a quarter of a standard deviation higher.

In Hypothesis 3, we posit that the social class of the firm owner strengthens the negative relationship between high-level achieved political ties and pollution. In line with this, we find a negative and significant interaction term between *High-level achieved political ties* and *Owner's social class* ($\beta = -0.638$, $p = 0.002$ in Model 5; $\beta = -0.779$, $p < 0.001$ in Model 9). Hypothesis 4 proposes that social class weakens the positive relationship between low-level achieved political ties and pollution. As expected, we find a negative and significant interaction term between *Low-level achieved political ties* and *Owner's social class* ($\beta = -0.388$, $p < 0.001$ in Model 6; $\beta = -0.421$, $p < 0.001$ in Model 9).

In Hypothesis 5, we assert that high-level government's attention to environmental issues strengthens the negative relationship between high-level achieved political ties and pollution. Indeed, we find a negative and marginally significant term between *High-level achieved political ties* and *High-Level environmental attention* ($\beta = -0.739$, $p = 0.072$ in Model 7; $\beta = -0.702$, $p = 0.070$ in Model 9). In Hypothesis 6, we argue that low-level government's attention

to economic growth strengthens the positive relationship between low-level achieved political ties and pollution. Consistent with that hypothesis, we find that the coefficient on the interaction term between *Low-level achieved political* ties and *Low-level economic attention* is positive and significant ($\beta = 0.158$, $p = 0.046$ in Model 8; $\beta = 0.145$, $p = 0.065$ in Model 9).

Our inference regarding the direction and significance of the interaction effects is supported by Figures 1 through 4. These figures are produced using the estimates from Model 9. In each figure, the y-axis represents firms' pollution intensity. The x-axis represents different values of the moderating variables, where the endpoints anchor the observed range of this variable in our estimation sample. The lines depict the moderation effects by showing how having a particular level of tie (compared to not having such a tie) relates to our dependent variable (pollution intensity) at different levels of the moderators.

Insert Figures 1- 4 here

Robustness Checks

We conducted three sets of robustness checks. First, we investigate potential endogeneity issues, using a two-stage instrumental variable approach (e.g., Haveman et al., 2017; Zheng, Ni, & Crilly, 2019; Zheng et al., 2015; Zhu & Chung, 2014), propensity score matching (e.g., Haveman et al., 2017; Zhang et al., 2016), and a three-stage least squares (3SLS) approach (e.g., Rocca, Fasano, Cappa, & Neha, 2022). Second, we use different estimation approaches and model specifications. We re-ran our models using Ordinary Least Square Regression (OLS) as well as models including a variety of alternative fixed effects (e.g., province-year fixed effects and industry-year fixed effects). Third, we use alternative measures for our dependent variable and our key explanatory variables. For example, instead of aggregating ties at different levels in high or low-level ties, we re-ran our models using five separate indicator variables. Due to space constraints, we do not present details of these numerous checks here.

An overview of the outcome of these checks is presented in Table 3 and detailed information is presented in Online Appendix B.

Insert Table 3 here

DISCUSSION

Environmental challenges like climate change demand coordinated action across stakeholders (George, Howard-Grenville, Joshi, & Tihanyi, 2016b). With firms as major contributors to record-high GHG emissions (IPCC, 2022), scholars have called for studying how firms and governments working in specific contexts can avert climate change (Aragon-Correa, Marcus, & Vogel, 2020; Nyberg & Wright, 2022). Our study contributes to this discourse by examining firm-government relationships and their impact on pollution, offering both theoretical insights and practical implications for business and society.

Theoretical Contribution

We contribute to the literature on the societal implications of political ties by providing a nuanced perspective on how achieved political ties shape firms' polluting behavior. A growing body of research has produced seemingly contradictory findings on whether political ties mitigate or exacerbate societal challenges. These inconsistencies may be partly due to a lack of integration between the literatures on political ties (e.g., Fisman & Wang, 2015; Zhang et al., 2016) and the multifaceted nature of governments (e.g., Luo et al., 2017; Wang et al., 2018). As a first step to address this issue, our study bridges these two streams of research by emphasizing the level of government as a strong contingency in shaping the effects of political ties on firm pollution. Rather than strengthening or weakening the effect in one direction, this contingency fundamentally changes the direction of the relationship between political ties and pollution. By recognizing that different levels of government vary in their priorities, constraints, and influence over firms, our study finds that high-level achieved political ties reduce firm

pollution, while low-level ties increase it. Such directionally divergent influences of achieved political ties advance prior work that mostly treated political ties as a level-agnostic construct (e.g., Fisman & Wang, 2015; Zhang et al., 2016). We also contextualize our two baseline predictions by introducing firm owner's social class and government attention to primary goals at different levels as moderators that shaped the strength of binding effect associated with political ties. These highlight the importance of considering the social and institutional characteristics of both actors in the government–firm owner relationship when examining the impact of political ties.

Our study paves the way to advance the broader political ties literature in two key directions: studying further types of ties and their associated mechanisms and theorizing across contexts.

Studying the implications of types of ties and associated mechanisms. By studying the implications of the binding mechanism of achieved ties for firms' pollution behaviour, our study lays the groundwork for exploring how other types of political ties and their mechanisms shape firms' pollution behavior, and their strategic choices more broadly. Scholars have identified three key mechanisms (i.e., bridging, buffering, and binding, [Gao et al., 2021]) through which political ties influence firm behavior. While our study focuses on the binding mechanism, due to its relevance to achieved ties, other mechanisms are important for different types of political ties, such as ascribed ties. Our theorizing can serve as a foundation to study how the level of political ties can also influence these mechanisms. The multi-tiered nature of government literature has outlined that different levels vary not only in priorities and power but also in roles, responsibilities, and resource allocation (Qian & Roland, 1998; Trounstine, 2009; Wang et al., 2018). These variations can be relevant for bridging and buffering, as they shape how firms leverage political ties to manage uncertainty, access resources, and navigate regulatory environments. Examining such differences across government levels could provide deeper insights into the broader theoretical implications of political ties.

Theorizing across contexts and over time. While our focus was on China during the period of our study, our arguments can be extended to other contexts and time periods. To facilitate such examinations across contexts, we briefly discuss the application of our theory to the cases of Canada and Belgium, as well as today's China.

First, Canada has two levels of government: the federal government (i.e., high-level government) and provincial governments (i.e., low-level government). Broadly speaking, the federal government places greater emphasis on environmental protection, given its role as a signatory to international agreements and its leadership in shaping global environmental policies (e.g., as a member of the G7 and OECD). Therefore, high-level political ties may exert binding pressures on firms to reduce pollution. In contrast, provincial governments vary significantly in their environmental priorities, with some provinces and territories enacting laws supporting fracking (e.g., Alberta, Saskatchewan, and Yukon) and others banning it (e.g., Nova Scotia). This variation suggests that the binding effect of achieved political ties may lead to increased pollution by such firms in some provinces and decreased pollution in others.

Second, Belgium is a small, developed country with a multi-party democratic political system and has two levels of government: the federal government (i.e., high-level of government) and regional governments (i.e., low-levels of government that overlap with Belgium's three regions: Flanders, Wallonia and Brussels).[18] The federal government is, among other things, responsible for the country's social security system and budget. Therefore, it is focused on maximizing economic growth, because it needs to keep unemployment as low as possible to minimize pressures on Belgium's extensive but strained social security system. This level is also responsible for complying with the European Union's public spending rules. Accordingly, ties to the federal government are likely to bind firms to pursue shorter-term economic growth, even at the expense of environmental performance. In contrast, the regional governments handle environmental protection, including legislation, implementation, and more recently, the allocation of substantial resources for green initiatives. Historically, these

governments exerted little effort to bind firms into reducing pollution. However, rising public pressure and international obligations have led to stricter environmental policies, making political ties to regional governments more likely to bind firms to pollution-reducing practices.

The third context is the China after our study period (i.e., 2014). In late 2014, China's national government passed the first amendments to the country's environmental protection law in 25 years, granting greater powers to environmental authorities and imposing harsher punishments for polluters. In 2021, President Xi Jinping pointed out at the Leaders' Summit on Climate that China has committed to swiftly moving from carbon peak to carbon neutrality, integrating such goals into its ecological conservation plan.[19] Therefore, high-levels of government is likely to continue to prioritize environmental goals, placing strengthened pro-environment pressures on firms with high-level achieved political ties (i.e., strengthened binding) to reduce pollution even more.

Meanwhile, low-level governments are under increasing pressure from the national government to advance the environmental agenda. For instance, in 2016, the Central Environmental Inspection Team was established to enhance regulatory oversight, and by the end of 2017, inspections covered all of mainland China (Li, Zhou, Bi, Liu, & Li, 2020). That year, 18,419 governmental officials and enterprises' leaders were formally investigated for environmental violations, and 103,081 public complaints were promptly resolved, nearly one-fifth of those in 2017. Given these developments, low-levels of the government will likely pay increasing attention to balancing economic and environmental goals within their jurisdictions, and might shift from binding firms with economic targets toward a more balanced approach, potentially leading to connected firms reducing their pollution over time. However, China's recent economic slowdown has also intensified pressures on low levels of government to meet challenging economic targets and balance shrinking budgets. This financial strain may further strengthen the binding pressures, potentially leading to higher pollution by connected firms.

In sum, while there might be differences in the specific predictions about the

environmental impact of political ties may vary across countries and over time, the main point is that studies that take into account the possibly varying implications of different levels of ties can generate theoretical insights and practical implications as suited to the context in question.

Practical Implications of Our Study

Climate change has become an urgent problem that governments, industry, and civil society can no longer ignore (Nyberg & Wright, 2022). Industrial emissions, responsible for 24% of global GHG emissions, have an undeniable role in climate change (IPCC, 2022). Industrial pollution also increases death rate (Rahman, Alam, & Velayutham, 2021) and thus, is also a major public health concern (e.g., Park, Montiel, Husted, & Balarezo, 2022). The social and economic consequences of pollution more broadly (i.e., industrial and other pollutions) are severe. For example, pollution is responsible for an estimated 16% of global deaths, with nearly 92% of these occurring in low-income and middle-income countries (Landrigan, Fuller, Acosta, Adeyi, Arnold, Baldé et al., 2018). Further, there is "growing evidence that pollution affects long run outcomes, like educational attainment, IQ, wages, adult poverty, [...] workplace productivity and labor supply. The effects of early life pollution exposure are also quite persistent, potentially affecting future generations of children" (Persico, 2021: 9). Given these broad negative consequences of pollution, multilateral agencies and scholarly communities have underscored the need for businesses and governments to work together to reduce pollution and alleviate climate change (IPCC, 2022; Landrigan et al., 2018).

Set against this background, our findings offer important implications. For managers, our findings highlight that they need to be mindful that achieved political ties can have unintended consequences on their firms' polluting behavior. For policymakers, our findings show that certain types of achieved political ties between firms and governments can help tackle climate change while others hamper it. Given the evidence that policies and regulations improve the environmental compliance of firms (Aragon-Correa et al., 2020), our findings suggest that misaligned efforts across government levels can also undermine progress. Hence, policymakers

should ensure that the goals of all the relevant levels of the government align towards solving societal and environmental problems. This echoes George et al. (2016b) who highlighted that tackling grand challenges requires multilevel and synchronized actions.

Limitations and Avenues for Future Research

Our study is not without limitations, which present opportunities for future research.

First, the lack of data availability from 2015 onward limits the generalizability of our findings to China today. However, our study provides a conceptual foundation for understanding the environmental implications of achieved political ties across government levels. This provides opportunities for researchers to validate or revise our theory using different data in China and elsewhere.

Second, our focus is on achieved political ties, which are strongly associated with the binding mechanism. While this is practically meaningful, particularly in the context of private firms in China, where high-level ascribed political ties are uncommon, future studies could explore the differences between various types of political ties, such as ascribed ties in other countries. Similarly, future work could also build on our study to explore how different mechanisms, such as bridging and buffering, might play out differently for political ties at various levels of government. Relatedly, given differences in size, public visibility, and regulatory scrutiny, future research could also compare achieved political ties between private and publicly listed firms.

Lastly, while the dataset we use was collected by national project teams and has been used in previous studies (e.g., Marquis & Qiao, 2020), our pollution measure is self-reported. Although we have taken steps to address this, future studies can study the implications of political ties by using more objective and accurate pollution data. Relatedly, since our data is pooled survey data, we were unable to test the causality of our predictions by directly measuring binding pressures. While we build on influential work (e.g., Zhang et al., 2016) and have used moderators to increase confidence in our theorization, the available data does not

allow us to establish a causal relationship. While we considered leveraging a quasi-natural experiment to strengthen identification, this proved challenging in the context of political ties. Politically connected firms often anticipate policy changes due to their privileged access to non-public information, making it difficult to identify an exogenous shock. Future research can explore ways to more directly observe the binding mechanism, perhaps by utilizing fine-grained panel data in different contexts or conducting experiments.

CONCLUSION

Unpacking business-government relationships is key to tackle global pollution challenges. Our study takes a step in this direction by integrating the literatures on political ties and the multifaceted nature of governments to introduce the level of government to which a firm has achieved political ties as an important contingency that affects firms' polluting behaviors. We hope that our study inspires more studies on the environmental and societal repercussions of business-government relationships. We also hope that our findings help policymakers to better understand the consequences of a fragmented approach to environment management, and design targeted incentives to better align the environmental priorities of low-levels of the government with those of the high-levels, fostering a unified path toward sustainability goals.

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FOOTNOTES

1. Most of the literature (e.g., Faccio, 2006; Tihanyi et al., 2019) considers that political ties entail direct connections, but do not include contributions to political campaigns, (undisclosed) payments to politicians, or other indirect ways in which firms might be tied to politicians.

2. The priorities of high- and low-levels of government might shift, and there might be differences within each level of government. Nevertheless, based on existing work on the multi-tiered government system in China (e.g., Luo et.al, 2017) and our interactions with government officials and business leaders, there are persistent differences in priorities across high- and low-levels of the government. Also, these differences across levels are generally more substantial than within-level variation. To indicate how our framework can accommodate changes, in the discussion section we note how it can be applied to China based on recent developments.

3. The emphasis on environment is a response to China's carbon dioxide emissions per capita increasing by 170.3% from 2000 to 2013, compared to the global average increase of 17.5% (Source: World Bank) and rapidly depleting natural resources, threatening the livability of major Chinese cities.

4. We examined how much the high-levels of government referred to environmental and economic issues in their annual reports. We found that the high-level government pays significant attention to environmental issues in the absolute, and also that environmental issues are gaining importance compared to economic issues. On average, the high level of government dedicated 8.46% of the text in their annual reports to environmental issues. The corresponding number for low-levels of the government was 4.49%. For text dedicated to economic issues we see the opposite pattern. Across our sample, on average, low-levels of the government dedicated 40.60% of the text in their reports to economic issues, with the corresponding number being 28.01% for high levels of the government. While these numbers imply that economic issues remain important for the high-levels of government in China, naturally, our point is that environmental issues have become of sufficient importance to expect high-levels of the government to pay considerable attention to them.

5. We adopted a purposive sampling approach (e.g., Patton, 2002) to select informants. We aimed to interview (a) senior businesspeople who have political ties and experience interacting with government officials on environmental issues and (b) individuals in senior positions at different levels of the government or government agencies who have experience with China's environmental policy and issues. We interviewed six business leaders and three government officials. Our interviews were conducted in Mandarin and lasted between 30 and 45 minutes. The interviews were semi-structured: we prepared a set of questions depending on the category of informants (i.e., business leaders or government officials) while leaving time for open-ended discussion. Given the sensitivity of the topic, our interviewees asked not to be recorded. Two interviewers took extensive notes in real-time and typed them out right after the interview. These notes were then translated to English (and re-translated to check the accuracy of the translation). Due to space constraints and to maintain the anonymity of interviewees, we do not report further details.

6. http://www.npc.gov.cn/c2/c30834/202407/t20240716_438256.html

7. The MEP, which is currently named the Ministry of Ecology and Environment, serves a role that is similar to that of the Environmental Protection Agency (EPA) in the U.S.

8. Violations and penalties are determined by MEP departments of the local government on a case-by-case basis.

9. The ACIE and ESR datasets share the same firm identifiers. Neither database provides information on political ties. Our purpose in referring to these two databases is to verify that the levies paid by firms closely reflects their actual emissions.

10. In China, becoming a delegate in the PC or CPPCC is the most prevalent way for private firm owners to access political ties (Li, Meng, & Zhang, 2006). It is rare for private owners to have working experience in the government, especially at the high levels of government. This is partly because high-level government leaders are prohibited from engaging in business for at least 3 years after their resignation or retirement (Article 107, Civil Servant Law in China). As a result, and as expected based on these circumstances, only 0.46% of owners worked at the city and above levels of government in our sample. In contrast, 38.64% of private owners have achieved political ties based on our operationalization. Thus, such achieved political ties provide enough variance regarding the presence or absence of political ties (and their levels). Conversely, the rarity of owners who have working experience in the government would greatly suppress the variance that is needed to test our hypotheses. We nevertheless account for the possible influence of ascribed political ties on the relationships we study by controlling for Owner government experience in our models.

11. Some studies (e.g., Luo et. al., 2017) have contrasted national-level and provincial-level political ties in China. However, possibly due to data limitations, or perhaps because they were studying the effect of political ties on outcomes other than pollution, such as CSR broadly or donations, these studies did not consider political ties to other levels of government. While there is variation across the national- and provincial-levels, as these studies have shown, once we consider the full spectrum of levels of ties and consider our research question – our classification is aligned with our theoretical rationale and the purpose of our study.

12. According to the Office of the State Council, the city-level and below government is responsible for the actual enforcement of environmental regulation within the jurisdiction.

13. Effects of this kind diminish non-linearly over distance (e.g., Anderson, 2011). Hence, our approach aligns with the work of Simons et al. (2016) and a broader body of research demonstrating distance-based decay effects.

14. When the focal firm is located in the same province as the province in which an accident occurs, we set the distance to 1km to avoid having the denominator to be zero. This implies that we do not assume any decay of the effects of distance in the same province

15. For example, in Qiangdao city's 2014 government annual report, it states "The main projected target is approximately 9% growth in the city's GDP". We recorded 9% for Qingdao city in 2014.

16. Our hypotheses remain supported at $p < 0.05$ if we use non-winsorized financial and accounting measures.

17. In a few cases this variable takes on a negative value. This is because some senior officials stayed beyond the official retirement age in their position, due to a lack of suitable replacements or a specific need for more experienced politicians to continue to be in charge.

18. Belgium has another level of government, i.e., community governments that overlap with the Flemish-, French-, and German-speaking communities in Belgium. However, this level has limited power and is largely responsible for education and cultural issues. Therefore, its impact on the polluting behavior of firms is likely to be negligible.

19. http://www.xinhuanet.com/english/2021-04/22/c_139899289.htm.

Table 1

Descriptive Statistics and Correlations

	Variable	Mean	S. D.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Pollution levy (scaled by sales and logged)	0.88	1.41	0.00	5.91													
2	High-level achieved political ties	0.03	0.17	0.00	1.00	-0.01												
3	Low-level achieved political ties	0.36	0.48	0.00	1.00	0.11	-0.13											
4	Owner's social class (standardized)	0.00	1.00	-2.83	2.48	0.07	0.13	0.25										
5	High-level environmental attention (standardized)	0.00	1.00	-0.61	5.99	-0.07	-0.03	-0.02	-0.00									
6	Low-level economic attention (standardized)	0.00	1.00	-1.79	5.34	0.09	-0.01	0.04	-0.02	-0.41								
7	Firm age	9.38	5.21	0.00	34.00	0.05	0.08	0.20	0.20	0.08	-0.15							
8	Firm size (employees logged)	4.05	1.57	0.69	10.46	0.15	0.17	0.36	0.41	0.04	-0.12	0.35						
9	Firm leverage (assets-over-liabilities)	0.26	0.41	0.00	3.15	0.00	0.05	0.12	0.12	0.05	-0.09	0.10	0.26					
10	Firm productivity (sales/employees logged)	3.14	1.31	0.01	6.80	-0.14	0.08	0.10	0.20	0.09	-0.17	0.15	0.11	0.20				
11	Firm performance (return on assets)	0.21	0.45	-0.33	3.20	0.02	0.01	-0.01	0.01	0.01	0.02	-0.01	0.01	-0.08	0.05			
12	Regional institutional development (province)	6.75	1.53	-0.30	9.88	-0.03	-0.03	0.04	0.12	0.44	-0.36	0.20	0.18	0.11	0.23	0.03		
13	Regional corruption (province)	24.95	5.87	2.65	46.3	0.08	0.01	0.03	-0.01	-0.18	0.40	-0.10	-0.07	-0.01	-0.07	-0.05	-0.14	
14	Regional environmental pollution - waste water (province)	17.71	16.56	0.04	78.56	0.04	-0.05	0.11	0.10	0.03	-0.03	0.10	0.08	-0.01	0.12	0.04	0.51	-0.10
15	Regional environmental pollution - waste gas (province)	2.14	1.41	0.00	7.91	0.04	0.00	0.10	0.11	0.01	-0.08	0.10	0.11	0.06	0.15	0.01	0.38	-0.03
16	Regional environmental investment (province)	1.23	0.47	0.15	4.66	-0.05	0.02	-0.06	-0.07	-0.15	0.06	-0.02	-0.06	0.01	0.02	-0.05	-0.28	-0.07
17	Regional enforcement inspection (province)	0.49	0.39	0.11	2.38	0.03	0.03	0.03	-0.04	-0.22	0.24	-0.11	-0.09	-0.08	-0.15	-0.01	-0.46	0.24
18	Regional enforcement penalty (province)	0.41	1.19	0.00	12.48	-0.03	0.02	0.01	-0.00	-0.01	-0.22	0.07	0.04	0.04	0.05	-0.01	0.14	-0.32
19	Regional GDP growth (province)	0.12	0.03	0.05	0.19	0.02	-0.00	0.03	-0.04	-0.34	0.59	-0.17	-0.13	-0.08	-0.16	-0.01	-0.38	0.38
20	Owner's gender	0.86	0.35	0.00	1.00	0.02	-0.01	0.09	0.09	0.00	-0.02	0.08	0.14	0.06	0.05	-0.03	0.05	0.01
21	Owner's education	3.69	1.21	1.00	6.00	-0.02	0.01	0.00	0.06	0.08	-0.16	0.08	0.10	0.02	0.10	0.01	0.06	-0.14
22	Owner's age	45.25	8.61	18.00	92.00	0.05	0.06	0.13	0.14	0.05	-0.05	0.32	0.22	0.09	0.09	-0.06	0.10	-0.02
23	Owner's international experience	0.05	0.22	0.00	1.00	-0.00	-0.02	0.00	-0.00	0.02	-0.01	-0.04	0.01	0.01	-0.01	0.01	0.04	-0.01
24	Owner's government experience	0.13	0.34	0.00	1.00	0.02	0.01	0.07	0.03	0.00	0.00	0.02	0.05	0.01	0.02	-0.02	-0.04	-0.01
25	High-level political leaders' career horizons	7.05	4.54	-7.50	21.5	0.10	0.01	0.07	0.05	-0.32	0.32	-0.06	-0.00	-0.03	-0.04	-0.02	-0.27	0.32
26	Low-level political leaders' career horizons	4.02	2.30	-1.75	10.25	0.05	0.07	0.02	0.02	-0.05	-0.07	0.09	0.08	0.11	0.03	-0.02	-0.05	0.20
27	High-level political leaders' change	0.34	0.47	0.00	1.00	0.04	-0.04	0.08	0.02	0.01	0.03	0.01	0.02	0.01	0.03	0.01	0.06	0.08
28	Low-level political leaders' change	0.41	0.49	0.00	1.00	0.05	0.04	0.09	0.10	0.06	-0.22	0.14	0.14	0.11	0.12	-0.02	0.22	0.05
29	High-level environmental effort	0.05	0.02	0.00	0.12	0.03	0.00	0.01	0.07	-0.09	-0.04	0.07	0.09	0.06	0.08	0.01	0.19	-0.08
30	Low-level environmental effort	0.07	0.02	0.02	0.13	0.10	0.04	0.09	0.03	-0.26	0.26	-0.08	-0.00	-0.00	-0.10	-0.02	-0.25	0.25
31	High-level economic attention	0.09	0.01	0.08	0.12	0.01	0.00	-0.03	-0.06	-0.36	0.56	-0.14	-0.14	-0.05	-0.13	-0.03	-0.45	0.40

	Variable	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
14	Regional environmental pollution - waste water (province)																	
15	Regional environmental pollution - waste gas (province)	0.60																
16	Regional environmental investment (province)	-0.25	0.10															
17	Regional enforcement inspection (province)	-0.34	-0.17	-0.04														
18	Regional enforcement penalty (province)	-0.08	-0.13	0.20	-0.02													
19	Regional GDP growth (province)	-0.22	-0.31	0.09	0.14	-0.23												
20	Owner's gender	0.06	0.04	-0.05	-0.02	-0.05	-0.02											
21	Owner's education	0.03	0.07	0.07	-0.04	0.12	-0.25	-0.00										
22	Owner's age	0.04	0.04	0.00	-0.03	0.04	-0.05	0.10	-0.03									
23	Owner's international experience	0.09	-0.00	-0.03	-0.06	-0.00	0.00	-0.03	0.03	-0.07								
24	Owner's government experience	-0.01	-0.03	0.01	0.04	0.02	0.03	0.03	0.01	0.07	0.02							
25	High-level political leaders' career horizons	0.12	0.18	-0.17	0.23	-0.27	0.13	0.05	-0.11	-0.04	0.01	0.02						
26	Low-level political leaders' career horizons	-0.33	0.00	0.09	0.12	0.03	-0.03	0.02	-0.05	0.02	-0.08	-0.00	0.15					
27	High-level political leaders' change	0.22	0.12	0.03	-0.10	-0.05	0.08	-0.02	-0.05	0.01	0.04	0.00	-0.07	-0.14				
28	Low-level political leaders' change	0.14	0.30	0.02	-0.09	0.05	-0.24	0.04	0.05	0.06	-0.02	-0.02	0.06	0.48	0.15			
29	High-level environmental effort	0.25	0.22	-0.04	-0.13	-0.05	-0.05	0.03	0.03	0.01	0.03	-0.01	0.14	-0.08	0.04	-0.01		
30	Low-level environmental effort	-0.22	0.01	0.02	0.28	-0.15	0.43	0.01	-0.22	-0.03	-0.04	0.05	0.28	0.34	-0.04	0.14	0.13	
31	High-level GDP growth target	-0.38	-0.29	0.28	0.25	-0.20	0.67	-0.05	-0.10	-0.05	-0.02	0.00	0.11	0.10	0.01	-0.15	-0.07	0.27

Notes: N = 6,758. Correlations ≥ |0.02| are significant at $p \leq 0.05$

Table 2

Main Results: Tobit Models Estimating Pollution Intensity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Constant	-5.907**	-6.002**	-6.017**	-6.066**	-6.159**	-6.274**	-6.023**	-6.144**	-6.436**
	(2.066)	(2.063)	(2.064)	(2.062)	(2.061)	(2.061)	(2.063)	(2.063)	(2.060)
Firm age	0.010	0.011	0.007	0.008	0.008	0.007	0.008	0.008	0.007
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Firm size (employees logged)	0.396***	0.410***	0.359***	0.372***	0.371***	0.369***	0.372***	0.369***	0.366***
	(0.031)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
Firm leverage (assets-over-liabilities)	-0.012	-0.015	-0.027	-0.028	-0.022	-0.028	-0.028	-0.033	-0.026
	(0.090)	(0.090)	(0.090)	(0.090)	(0.090)	(0.089)	(0.090)	(0.090)	(0.089)
Firm productivity (sales / employees logged)	-0.145***	-0.138***	-0.156***	-0.150***	-0.150***	-0.153***	-0.151***	-0.151***	-0.154***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Firm performance (return on assets)	0.179*	0.180*	0.183*	0.183*	0.183*	0.176*	0.184*	0.180*	0.175*
	(0.083)	(0.083)	(0.083)	(0.083)	(0.083)	(0.083)	(0.083)	(0.083)	(0.084)
Regional institutional development (province)	0.041	0.050	0.068	0.071	0.077	0.076	0.067	0.068	0.078
	(0.167)	(0.166)	(0.166)	(0.166)	(0.166)	(0.166)	(0.166)	(0.166)	(0.166)
Regional corruption (province)	0.063***	0.062***	0.063***	0.062***	0.063***	0.063***	0.063***	0.064***	0.066***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Regional environmental pollution - waste water (province)	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.010	0.011
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Regional environmental pollution - waste gas (province)	-0.001	0.004	-0.013	-0.008	-0.004	0.003	-0.008	0.001	0.020
	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)
Regional environmental investment (province)	-0.317	-0.309	-0.319†	-0.313	-0.307	-0.307	-0.326†	-0.322†	-0.318†
	(0.195)	(0.193)	(0.194)	(0.193)	(0.193)	(0.193)	(0.193)	(0.193)	(0.193)
Regional enforcement inspection (province)	-0.229	-0.237	-0.270	-0.271	-0.281	-0.230	-0.270	-0.259	-0.228
	(0.288)	(0.287)	(0.286)	(0.286)	(0.286)	(0.286)	(0.286)	(0.285)	(0.285)
Regional enforcement penalty (province)	0.089†	0.092†	0.087†	0.089†	0.088†	0.091†	0.090†	0.089†	0.090†
	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.052)
Regional GDP growth (province)	4.736	4.403	5.018	4.765	4.778	5.162	4.858	4.839	5.363
	(4.515)	(4.517)	(4.513)	(4.515)	(4.508)	(4.509)	(4.515)	(4.512)	(4.497)
Owner's gender	0.021	0.001	-0.001	-0.011	-0.009	-0.014	-0.011	-0.019	-0.018
	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)
Owner's education	-0.009	-0.011	-0.011	-0.012	-0.011	-0.011	-0.012	-0.009	-0.007
	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Owner's age	0.012*	0.012*	0.011*	0.012*	0.012*	0.011*	0.012*	0.012*	0.011*
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Owner's international experience	-0.069	-0.075	-0.064	-0.068	-0.079	-0.080	-0.068	-0.072	-0.098
	(0.177)	(0.178)	(0.178)	(0.178)	(0.178)	(0.178)	(0.178)	(0.178)	(0.177)
Owner's government experience	0.025	0.020	0.006	0.005	0.006	0.002	0.004	0.006	0.003
	(0.115)	(0.115)	(0.115)	(0.115)	(0.115)	(0.114)	(0.115)	(0.115)	(0.114)

Notes: Table continued on the next page.

Table 2 (Continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Low-level political leaders' career horizons	0.025†	0.024†	0.022	0.021	0.021	0.020	0.021	0.023	0.021
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
High-level political leaders' career horizons	-0.037	-0.035	-0.033	-0.032	-0.031	-0.029	-0.032	-0.033	-0.028
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)	(0.044)	(0.045)	(0.045)	(0.044)
Low-level political leaders' change	0.155	0.148	0.149	0.145	0.143	0.139	0.146	0.140	0.133
	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)	(0.100)
High-level political leaders' change	-0.048	-0.046	-0.045	-0.044	-0.055	-0.045	-0.047	-0.056	-0.071
	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)	(0.129)
Low-level environmental effort	0.309	0.316	0.895	0.835	0.853	0.959	0.823	0.665	0.824
	(2.151)	(2.150)	(2.149)	(2.149)	(2.148)	(2.149)	(2.149)	(2.150)	(2.147)
High-level environmental effort	12.368*	12.251*	12.281*	12.214*	12.115*	12.846*	12.200*	12.152*	12.712*
	(5.111)	(5.103)	(5.100)	(5.095)	(5.092)	(5.089)	(5.097)	(5.091)	(5.081)
Owner's social class	0.080†	0.088*	0.063	0.070	0.089*	0.213***	0.071	0.068	0.247***
	(0.044)	(0.044)	(0.044)	(0.044)	(0.045)	(0.057)	(0.044)	(0.044)	(0.059)
High-level economic attention	-6.353	-5.926	-6.870	-6.529	-6.188	-5.358	-6.459	-5.791	-4.080
	(13.611)	(13.602)	(13.605)	(13.602)	(13.580)	(13.609)	(13.609)	(13.615)	(13.603)
High-level environmental attention	-0.000	-0.005	-0.006	-0.008	-0.008	-0.006	-0.004	-0.011	-0.003
	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)
Low-level economic attention	0.039	0.037	0.034	0.034	0.035	0.036	0.034	-0.037	-0.028
	(0.071)	(0.071)	(0.071)	(0.071)	(0.071)	(0.071)	(0.071)	(0.081)	(0.081)
High-level achieved political ties		-0.735***		-0.488*	-0.019	-0.605**	-0.687**	-0.485*	-0.225
		(0.207)		(0.214)	(0.273)	(0.219)	(0.244)	(0.214)	(0.290)
Low-level achieved political ties			0.420***	0.373***	0.362***	0.447***	0.373***	0.369***	0.437***
			(0.084)	(0.087)	(0.088)	(0.089)	(0.087)	(0.088)	(0.089)
High-level achieved political ties x Owner's social class					-0.638**				-0.779***
					(0.209)				(0.212)
Low-level achieved political ties x Owner's social class						-0.388***			-0.421***
						(0.083)			(0.084)
High-level achieved political ties x High-level environmental attention							-0.739†		-0.702†
							(0.411)		(0.387)
Low-level achieved political ties x Low-level economic attention								0.158*	0.145†
								(0.079)	(0.079)
Year Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included
Province Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included
Number of Observations	6,758	6,758	6,758	6,758	6,758	6,758	6,758	6,758	6,758
Log Pseudo-likelihood	-8558.1	-8552.8	-8546.2	-8544.1	-8540.5	-8533.4	-8543.1	-8542.1	-8525.4
F-statistic	17.15***	17.12***	17.36***	17.22***	17.11***	17.45***	17.05***	17.06***	17.06***

Notes: Robust standard errors are in parentheses. Financial/accounting measures are winsorized at 99%. All tests are two-tailed: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

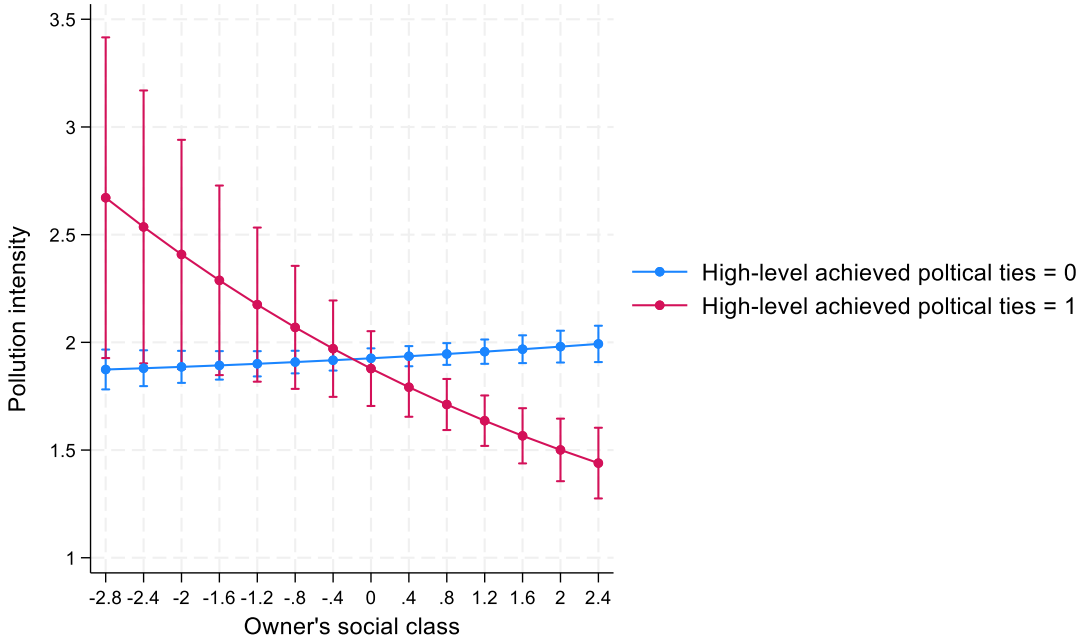
Table 3

Results Summary of Robustness Checks

	Robustness checks		H1: High-level achieved political ties	H2: Low-level achieved political ties	H3: High level achieved political ties × Owner's social class	H4: Low-level achieved political ties × Owner's social class	H5: High-level achieved political ties × High-level environmental attention	H6: Low-level achieved political ties × Low-level economic attention
Endogeneity	**Two-stage instrumental variable approach**	Selection high-level achieved ties	β = -0.385, p = 0.07	β = 0.335, p < 0.001	β = -0.578, p = 0.006	β = -0.352, p < 0.001	β = -0.739, p = 0.058	β = 0.016, p = 0.858
		Selection low-level achieved ties	β = -0.356, p = 0.093	β = 0.365, p < 0.001	β = -0.536, p = 0.012	β = -0.298, p < 0.001	β = -0.753, p = 0.057	β = 0.184, p = 0.020
	Propensity score matching	High-level achieved political ties as treatment	β = -0.421, p = 0.052	β = 0.336, p < 0.001	β = -0.650, p = 0.002	β =-0.367, p <0.001	β = -0.691, p = 0.073	β = 0.025, p = 0.778
		Low-level achieved political ties as treatment	β = -0.526, p = 0.015	β = 0.375, p < 0.001	β = -0.652, p = 0.002	β = -0.366, p < 0.001	β = -0.751, p = 0.072	β = 0.154, p = 0.053
	Three-stage-least square approach	Treating both low-level political ties and high-level political ties are endogenous variables	β = -0.177, p = 0.088	β = 0.138, p < 0.001	β = -0.302, p = 0.004	β = -0.134, p < 0.001	β = -0.070, p = 0.580	β = 0.102, p = 0.003
Different estimation approaches and model specifications		Ordinary Least Square regression	β = -0.193, p = 0.026	β = 0.137, p = 0.001	β = -0.301, p = 0.001	β = -0.135, p < 0.001	β = -0.064, p = 0.182	β = 0.101, p = 0.005
		Included province-year fixed effects	β = -0.484, p = 0.023	β = 0.326, p < 0.001	β = -0.533, p = 0.011	β = -0.390, p < 0.001	β = -0.881, p = 0.065	β = 0.150, p = 0.062
		Included industry-year fixed effects	β = -0.451, p = 0.038	β = 0.365, p < 0.001	β = -0.676, p = 0.001	β = -0.394, p < 0.001	β = -0.748, p = 0.070	β = 0.145, p =0.064
Alternative specification of the dependent variable (DV)		Untransformed and unscaled DV	β = -3.744, p = 0.012	β = 1.422, p = 0.006	β = -3.572, p =0.019	β = -1.175, p = 0.016	β = -5.543, p = 0.080	β = 0.200, p = 0.663
		Pollution levy scaled by total assets	β = -0.688, p = 0.007	β = 0.378, p < 0.001	β = -0.680, p = 0.006	β = -0.450, p < 0.001	β = -0.893, p = 0.074	β = 0.205, p = 0.023
Alternative specification of selected explanatory variables	**Sensitivity to the level of achieved political tie split approach**	Dropped firms that have ties to the prefectural or provincial levels	β = -0.922, p = 0.050	β = 0.428, p < 0.001	β = -0.725, p = 0.053	β =-0.370, p < 0.001	β = -0.954, p = 0.403	β = 0.160, p = 0.077
		Used five separate indicator variables instead for five levels of political ties	Dummy variables that capture ties to the prefectural, county, and township levels were all positive and jointly significant (p = 0.020 for provincial and national level; p <0.001 for the prefectural, county, and township levels)					
	Firms with both high-level and low-level achieved political ties	Used the lowest level to categorize the level of political ties	β = -0.503, p = 0.035	β = 0.360, p < 0.001	β = - 0.709, p = 0.004	β = -0.397, p < 0.001	β = -0.864, p = 0.154	β = 0.158, p = 0.047
		Coded firms as having both high- and low-level ties	β = -0.509, p = 0.033	β = 0.373, p < 0.001	β = - 0.709, p = 0.004	β = -0.397, p < 0.001	β = -0.864, p = 0.154	β = 0.158, p = 0.047
		Removed dual-level ties from the analysis	β = -0.521, p = 0.030	β = 0.369, p < 0.001	β = - 0.709, p = 0.004	β = -0.397, p < 0.001	β = -0.864, p = 0.154	β = 0.158, p = 0.047
Alternative measure for high-level environmental attention		Log distance decay function	β = -0.488, p = 0.023	β = 0.373, p < 0.001	β = - 0.638, p = 0.002	β = -0.388, p < 0.001	β = -0.689, p = 0.047	β = 0.158, p = 0.046

Figure 1

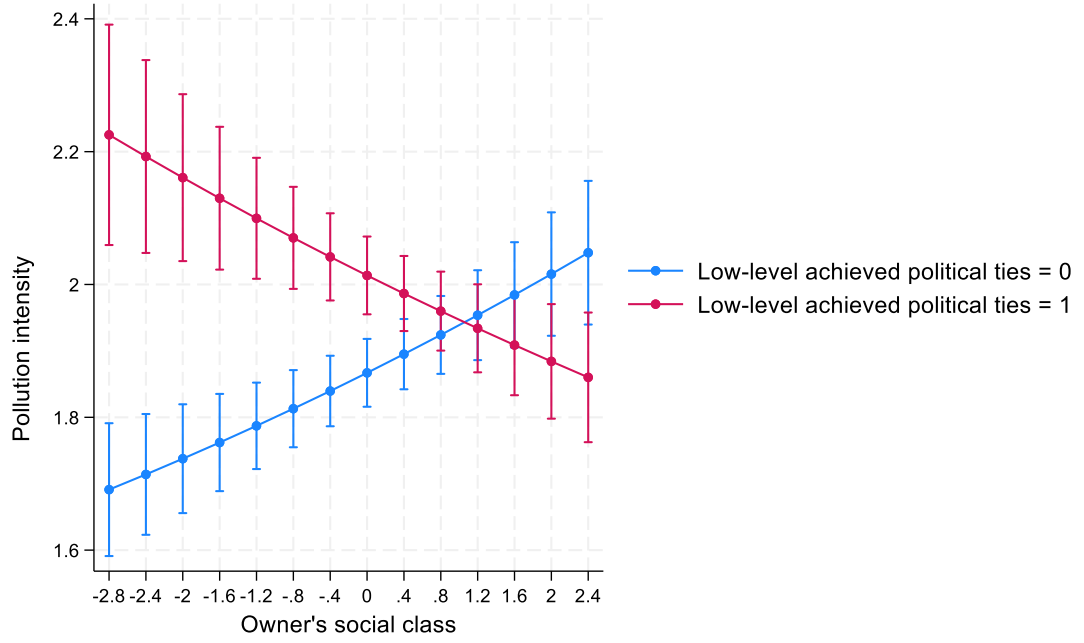
Plot of the Interaction between High-level Achieved Political Ties and Owner's Social Class (with 95% Confidence Intervals)



Note: Compared to firms that do not have high-level achieved political ties (blue line), firms with high-level achieved political ties (red line) exhibit lower pollution intensity when the owner's social class is higher.

Figure 2

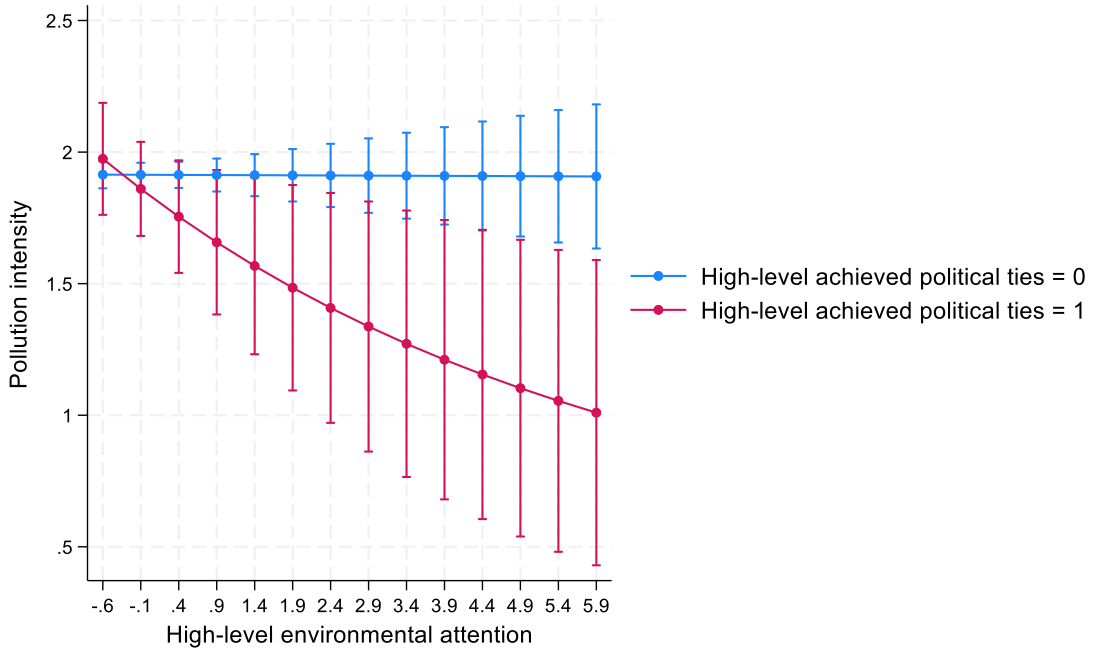
Plot of the Interaction between Low-level Achieved Political Ties and Owner's Social Class (with 95% Confidence Intervals)



Note: Compared to firms that do not have low-level achieved political ties (blue line), firms with low-level achieved political ties (red line) exhibit lower pollution intensity when the owner's social class is higher.

Figure 3

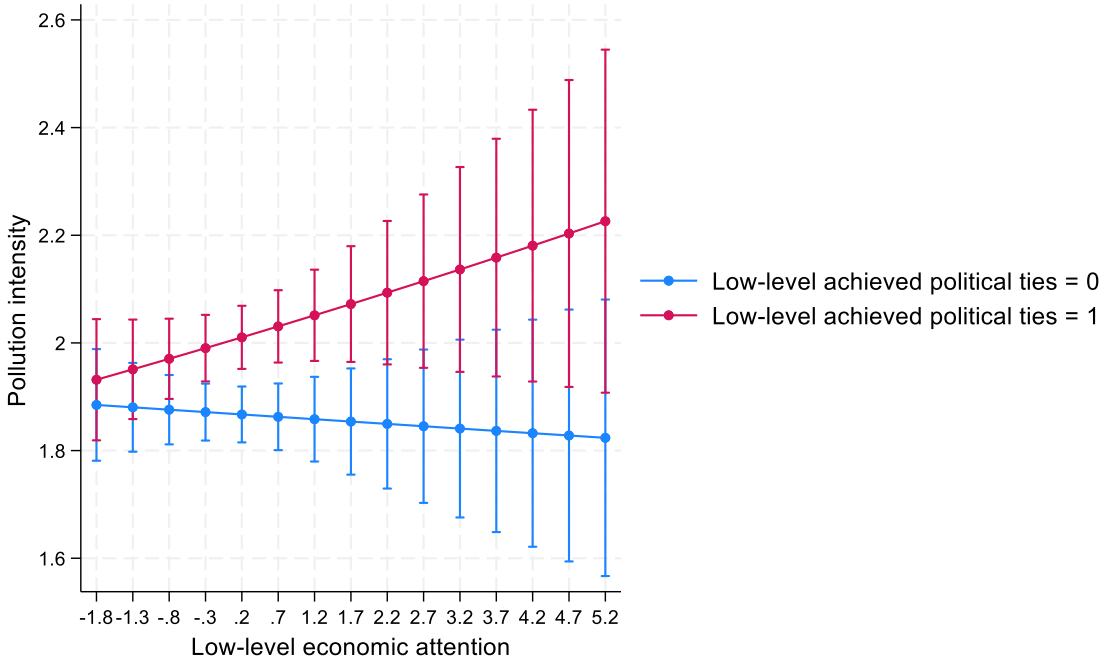
Plot of the Interaction between High-level Achieved Political Ties and High-level Environmental Attention (with 95% Confidence Intervals)



Note: Compared to firms that do not have high-level achieved political ties (blue line), firms with high-level achieved political ties (red line) exhibit lower pollution intensity when high-level environmental attention is higher.

Figure 4

Plot of the Interaction between Low-level Achieved Political Ties and Low-level Economic Attention (with 95% Confidence Intervals)



Note: Compared to firms that do not have low-level achieved political ties (blue line), firms with low-level achieved political ties (red line) exhibit higher pollution intensity when the low-level economic attention is higher.

ONLINE APPENDIX A
ADDITIONAL INFORMATION ABOUT CHINA'S POLLUTION LEVY SYSTEM

In this appendix, we provide additional information on China's pollution levy system, on which we rely to construct our dependent variable, and also direct interested readers to additional sources of information about this system.

The System's History and General Functioning

The pollution levy system can be traced back to 1979, when in response to China's growing pollution due to its rapid industrial development, the state council first proposed to write pollution levies into the Environmental Protection Law (EPL). This was a milestone in China's environmental legal system (Jiang, Lin, & Lin, 2014; Wang & Wheeler, 2005). Article 18 of the EPL specifies that: "*In cases where the discharge of pollutants exceeds the threshold set by the state, a compensation fee shall be charged according to the quantities and concentration of the pollutants released*." In 1982, the pollution levy system was officially implemented nationwide by the issuance of "Interim Measures on the Collection of Pollution Discharge Fee." Over the years, the system has been extended and tightened,[1] but the changes since 2003 are the most relevant for our study, given our coverage (from 2008 until 2014). Since 2003, China has taken additional steps to ensure strict enforcement by passing a series of environmental laws, regulations, and policies that incorporate a variety of environmental information disclosure requirements and monitoring mechanisms (e.g., the 2003 Clean Production Promotion Law, and the 2003 Environmental Impact Assessment Law). Further, the new pollution charge policy[2] was brought into effect in 2003. With this change, firms are charged significantly higher levies than before, on the basis of a nation-wide formula for calculating levies across industries and regions (Jiang et al., 2014). The enforcement of the system also became more stringent with this change (e.g., Wang & Jin, 2007). Specifically, the levy a firm must pay is calculated based on (a) the levy rate, (b) the firm's discharge volume into the environment (to the extent that it goes beyond the threshold set by the state), and (c) the concentration of emitted water, gas, solid waste, and noise. As a result, if a firm does not pay a levy, this might be due to a number of reasons: (a) the firm is not polluting at all, (b) the firm is polluting below the state's threshold or polluting unregulated emissions, and/or (c) the firm has taken measures to clean up their emissions, so

[1] For a more detailed overview of the history of China's pollution levy system, see for example Jiang et al. (2014).
[2] The policy is only in Chinese and is available at http://www.gov.cn/gongbao/content/2003/content_62565.htm

that they do not negatively affect the environment. Since the levy system covers a broad set of pollutants and the minimum threshold is set fairly low, the levies that the firms are charged end up closely approximating the level of firms' emissions. This was also confirmed by an official working in the Ecological Environment Bureau we interviewed, who was confident that the levies indeed capture actual pollution levels: "*pollution levy clearly reflects the level of pollution for firms because it is calculated based on the level of pollution directly emitted to the environment*." Next, we will discuss in more detail how this system works in practice.

The System's Practical Workings

In practice, the levy system is implemented as follows: First, firms have to self-report their emissions. Specifically, at the beginning of each year, firms must register a pollution license with their local Environmental Protection Bureau (EPB). Then, at the end of each quarter, firms must self-report their emissions by filling out a detailed form, including various information such as the volume of each pollutant and concentrations, diagrams of the production process, and the date and time of the emission (Jiang et al., 2014).

Second, these self-reported emissions are carefully checked. Namely, local EPBs cross-check these reports in several objective ways, including the use of material balance models and historical data from the facility (Chen, Xu, & Qi, 2022; Wang & Wheeler, 2005). EPB inspectors also make spot/unannounced on-site visits and inspect/measure actual pollution levels. Once the firms' self-reported emissions are verified in this manner, levies will be calculated, and collected by local EPBs (Lin, 2013).

Third, the system is strictly enforced, with significant penalties for false reporting and/or non-cooperation with inspections. For example, in 2021, Danyang Longjiang Iron and Steel Co., Ltd. (located in Jiangsu province) was fined 8 million RMB (approximately USD 1.2 million) in total because its managers falsified and forged monitoring data. Further, the managers and other parties who were deemed to be involved were also separately fined and also sentenced to over two years in prison.[3] In addition to imposing financial penalties, the system can revoke discharge licenses, suspend operations of firms, and make firms responsible to rectify or financially compensate for the environmental damage they caused. The effectiveness of the policy changes since 2003 and the enforcement of the pollution levy system is reflected in that in 2012 there were 117,308 environmental penalty cases (as compared to 55,209 in 2000) in China that were identified by one of the 2,327 Environmental

[3] https://www.mee.gov.cn/ywdt/xwfb/202107/t20210727_851495.shtml (Case was announced by Ministry of Ecology and Environment of the People's Republic of China, in Chinese)

Monitoring Stations across the country (as compared to 31 in 2000) (China Environment Year Statistics, 2013).

Finally, we would like to note that the levy system is implemented and enforced by the environmental monitoring and inspection agencies (their branches at these local units) and not per se directly by the local *government*, i.e., the People's Congress (PC) or the Chinese People's Political Connection Consultative Conference (CPCC) representatives at the local level. As a result, we believe that it is not especially likely that lower-level government ties would result in firms underreporting their emissions.

Overall, the pollution levy that firms are charged is considered an accurate, albeit imperfect, indicator of firms' actual pollution.

ONLINE APPENDIX B
FURTHER INFORMATION ABOUT ROBUSTNESS CHECKS

In this Appendix, we provide further information about the robustness checks we conducted, the results/outcomes of which are summarized in Table 3 in the main document. Any details beyond what we describe here are available upon request.

Endogeneity

While control variables help mitigate confounds and omitted variable bias, they might not rule out other endogeneity concerns. Specifically, endogeneity concerns might arise because firms do not form political ties randomly. There are two common approaches in the management literature on political ties to mitigate this particular potential source of endogeneity: First, some studies use a two-stage instrumental variable approach (e.g., Haveman, Jia, Shi, & Wang, 2017; Zheng, Ni, & Crilly, 2019; Zheng, Singh, & Mitchell, 2015; Zhu & Chung, 2014). Second, a smaller number of studies use matching approaches, such as propensity score matching (e.g., Haveman et al., 2017; Zhang, Marquis, & Qiao, 2016). While most studies use one of these approaches, we checked the robustness of our findings using both approaches, which might jointly mitigate endogeneity concerns arising from self-selection. In addition, to further mitigate endogeneity concerns we also used a three-stage least squares (3SLS) approach (e.g., Rocca, Fasano, Cappa, & Neha, 2022).

Two-Stage Instrumental Variable Approach. As we have two potentially endogenous variables (i.e., high-level achieved political ties and low-level achieved political ties), we conducted a two-stage approach to account for self-selection and endogenous treatments for each of them separately. This approach is widely used in prior studies on political ties (e.g. Haveman, Jia, Shi, & Wang, 2017; Zheng et al., 2019; Zheng, Singh, & Mitchell, 2015; Zhu & Chung, 2014). Specifically, we estimated a Probit model in the first stage, where the dependent variable is 1 if the firm owner has high-level achieved political ties (or low-level achieved political ties) and 0 otherwise. The inverse Mill's ratio (IMR) calculated from this first-stage estimation is then included as a control variable in the second-stage estimation, where the same Tobit model specifications are used as those in Table 2.

For high-level achieved political ties, we use *Geographic distance to high-level government* (in kilometers and log-transformed) as the exclusion restriction. We calculated this variable by averaging the distance from the firm's headquarters to (i) the provincial government office building and (ii) the national government office building (i.e., the State Council). We sourced the registered address of every firm and government office building through Google

Earth and followed Reuer and Lahiri (2014) to calculate geographic distance. Because geographic distance impacts social interactions (Sorenson & Stuart, 2001), we expect that, compared to firms that are close to the high-level government, greater geographic distance to high-level government will increase a firm's need to develop achieved political ties (whereas there is no obvious reason for this variable to be directly related to *Pollution intensity*) (Brown, Yaşar, & Rasheed, 2018). For low-level achieved political ties, we used *High-speed rail* as an exclusion restriction, operationalized as an indicator variable that is equal to 1 when high-speed rail is available in the city where the firm's headquarters is located and 0 otherwise. We source the data from the Chinese High-speed Rail and Airline Database. In line with prior studies (Ahlfeldt & Feddersen, 2018; Ke, Chen, Hong, & Hsiao, 2017), we expect that high-speed rail in a city facilitates resource mobility within and across cities, therefore making it less necessary for firms to rely on low-level achieved political ties (and there is no reason to expect an independent impact of the presence of high-speed rail on firm pollution).

Empirically, neither *Geographic distance to high-level government* ($p = 0.292$) nor *High-speed rail* ($p = 0.786$) have a significant coefficient in predicting firm pollution if we add them to our second stage, i.e., main estimation, models, as consistent with our expectations and rationale above in as assessing them as suitable exclusion restrictions. For the case of high-level achieved political ties as the potentially endogenous variable, Model 1 of Table B1 presents the results of the first stage of the two-stage instrumental variable approach. The coefficient of *Geographic distance to high-level government* is positive and significant ($\beta = 0.294$, $p = 0.017$). Model 2 presents the results of the second stage model. The coefficients of *High-level achieved political ties* ($\beta = -0.385$, $p = 0.070$), and *Low-level achieved political ties* ($\beta = 0.335$, $p < 0.001$), are in the predicted direction, as consistent with our main findings, albeit with the former being only marginally significant. In addition, the coefficients of the interaction term *High-level achieved political ties* × *Owner's social class* ($\beta = -0.578$, $p = 0.006$ in Model 3), *Low-level achieved political ties* × *Owner's social class* ($\beta = -0.352$, $p < 0.0001$ in Model 4), and *High-level achieved political ties* × *High-level environmental attention* ($\beta = -0.739$, $p = 0.058$ in Model 5) are all significant and consistent with our main results. However, the coefficient on *Low-level achieved political ties* × *Low-level economic attention* ($\beta = 0.016$, $p = 0.858$) is not significant. Similarly, Models 8-14 Table B1 report the results of the two-stage instrumental variable approach for the case of low-level political ties as the potentially endogenous variable. The coefficient of *High-speed rail* in the first stage model is negative and significant ($\beta = -0.154$, $p = 0.008$ in Model 8). The second stage results follow a similar pattern as the corresponding ones in Table 2 ($\beta = -0.356$, $p = 0.093$ for *High-level achieved political*

ties, $\beta = 0.365$, $p < 0.001$ for *Low-level achieved political ties*, $\beta = -0.536$, $p = 0.012$ for *High-level achieved political ties × Owner's social class,* $\beta = -0.298$, $p < 0.001$ for *Low-level achieved political ties × Owner's social class,* $\beta = -0.753$, $p = 0.057$ for *High-level achieved political ties × High-level environmental attention*, $\beta = 0.184$, $p = 0.020$ for *Low-level achieved political ties × Low-level economic attention*).

Propensity Scores Matching (PSM). PSM alleviates endogeneity concerns by matching, on observable variables, firms that receive a "treatment" (in our case, having high-level or low-level political ties) with those that do not. The probability of a firm owner having high-level political ties (or low-level political ties) is modelled using a Probit regression using the same control variables as those in Model 1 in Table 2. We adopted the nearest neighbor matching method within a specified caliper (0.01). Tests of the difference in the variables between the treated and controlled groups in the resulting matched samples are mostly not significant at the 5% level[4] and the Pseudo-R^2 after the matching was very small (0.044 for high-level achieved political ties as the treatment, 0.008 for low-level achieved political ties as the treatment), both of which suggest that a good match was performed and that the covariates were balanced across the treatment and control groups. Using this matched sample, we ran the same models as those in Table 2 and report the new results in Table B2. Whether we use high-level achieved political ties or low-level political ties as the treatment, the pattern of results largely remains consistent with our predictions. Specifically, for high-level achieved political ties as the treatment for PSM, Model 1 yields marginal support for Hypothesis 1 (*High-level achieved political ties*) ($\beta = -0.421$, $p = 0.052$), and support for Hypothesis 2 (*Low-level achieved political ties*) ($\beta = 0.336$, $p < 0.001$). In terms of the moderation effect, Model 2 supports Hypothesis 3 (*High-level achieved political ties × Owner's social class*) ($\beta = 0.650$, $p = 0.002$), and Model 3 supports Hypothesis 4 (*Low-level achieved political ties × Owner's social class*) ($\beta = -0.367$, $p < 0.001$), and Model 4 marginally supports Hypothesis 5 (*High-level achieved political ties × High-level environmental attention*) ($\beta = -0.691$, $p = 0.073$). However, Hypothesis 6 (*Low-level achieved political ties × Low-level economic attention*) ($\beta = 0.025$, $p = 0.778$) is not supported. Similarly, for low-level achieved political ties as the treatment for PSM, Models 7 - 12 provide strong support for Hypotheses 1 through 4 ($\beta = -0.526$, $p = 0.015$ for *High-level achieved political ties,* $\beta = 0.375$, $p < 0.001$ for *Low-level*

[4] For low-level achieved political ties as the treatment, *p*-values in the balance test are significant at 5% only for *Regional enforcement penalty* ($p = 0.048$) and *High-level economic attention* ($p = 0.036$). High-level economic attention had a better balance (or lower imbalance) after matching (went from $p < 0.002$ *to* $p = 0.036$). In addition, the overall matching quality increases significantly (median bias decreases from 6.3 to 2.2, Pseudo-R^2 decreases from 0.192 to 0.008) after matching.

achieved political ties, β = -0.366, $p < 0.001$ for *High-level achieved political ties × Owner's social class,* β = -0.652, $p = 0.002$ for *Low-level achieved political ties × Owner's social class*), while Hypotheses 5 and 6 receive only marginal support (β = -0.751, $p = 0.072$ for *High-level achieved political ties × High-level environmental attention*, $\beta = 0.154$, $p = 0.053$ for *Low-level achieved political ties × Low-level economic attention)*.

Three-Stage-Least Squares. To further mitigate endogeneity concerns we also adopted a three-stage least squares (3SLS) approach in which we treat both *Low-level achieved political ties* and *High-level achieved political ties* as endogenous variables. This is another approach that has been used in the context of political ties (e.g., Rocca et al., 2022) and complements the two previous approaches we have detailed, as it allows us to endogenize both political tie measures simultaneously and avoids the often-challenging requirements to find suitable instrumental variables.[5] The results that we obtain through this approach, as reported in Table B3, are again consistent with those that we report in our main analysis (β = -0.177, $p = 0.088$ for *High-level achieved political ties,* $\beta = 0.138$, $p < 0.001$ for *Low-level achieved political ties*, β = -0.302, $p = 0.004$ for *High-level achieved political ties × Owner's social class,* β = -0.134, $p < 0.001$ for *Low-level achieved political ties × Owner's social class,* $\beta = 0.102$, $p = 0.003$ for *Low-level achieved political ties × Low-level economic attention*), except for Model 4 testing Hypothesis 5 (β = -0.007, $p = 0.58$ for *High-level achieved political ties × High-level environmental attention)*.

In sum, our results remain mostly robust using these three established approaches to deal with endogeneity. In combination with our main analysis, these leave us confident that our conclusions are not materially affected by the endogeneity that might arise because firms do not form political ties randomly.

Different Estimation Approach and Model Specifications

We checked the robustness of our findings, using Ordinary Least Square Regression (OLS) instead of Tobit regressions to estimate Models 1 to 9 in Table 2, which yielded results that are mostly consistent with those in our main analysis (β = -0.193 and $p = 0.026$ for *High-level achieved political ties*, $\beta = 0.137$, $p < 0.001$ for *Low-level achieved political ties,* β = -0.301, $p = 0.001$ for *High-level achieved political ties × Owner's social class,* β = -0.135, $p <$ 0.001 for *Low-level achieved political ties × Owner's social class, and* $\beta = 0.101$, $p = 0.005$ for *Low-level achieved political ties × Low-level economic attention*), except for Hypothesis 5 (β =

[5] In this approach, there is no requirement/need to find an instrumental variable. Identification alone is sufficient, as the 3SLS technique uses all exogenous variables in the model to create a combined variable that acts as the "best instrument" (Kennedy, 2006; Greene, 2012)

-0.064, $p = 0.182$ for *High-level achieved political ties × High-level environmental attention)*.

In our main analysis, we included year, industry, and province fixed effects. To see if accounting for *time-varying* location-based heterogeneity would change our inference, we re-ran our models with province-year fixed effects. To run these models, we removed the regional-level control variables. Our six predictions continue to receive support based on the results from this estimation ($\beta = -0.484$, $p = 0.023$ for *High-level achieved political ties*; $\beta = 0.326$, $p < 0.001$ for *Low-level achieved political ties,* $\beta = -0.533$, $p = 0.011$ for *High-level achieved political ties × Owner's social class,* $\beta = -0.390$, $p < 0.001$ for *Low-level achieved political ties × Owner's social class,* $\beta = -0.881$, $p = 0.065$ for *High-level achieved political ties × High-level environmental attention and* $\beta = 0.150$, $p = 0.062$ for *Low-level achieved political ties × Low-level economic attention*). Finally, we also ran our models using time-varying industry effects and observed a similar pattern of results, further strengthening support for our hypotheses ($\beta = -0.451$, $p = 0.038$ for *High-level achieved political ties*; $\beta = 0.365$, $p < 0.001$ for *Low-level achieved political ties,* $\beta = -0.676$, $p = 0.001$ for *High-level achieved political ties × Owner's social class,* $\beta = -0.394$, $p < 0.001$ for *Low-level achieved political ties × Owner's social class,* $\beta = -0.748$, $p = 0.007$ for *High-level achieved political ties × High-level environmental attention and* $\beta = 0.145$, $p = 0.064$ for *Low-level achieved political ties × Low-level economic attention*).

Alternative Specification of the Dependent Variable

We used a number of alternative specifications of our dependent variable. First, in our main analysis, we followed Zhang (2019) and used a pollution intensity measure that is the natural logarithm of the pollution levy paid by a firm as scaled by its sales revenue. We assessed the sensitivity of our results to instead using the untransformed and unscaled pollution levy paid by a firm. The results are mostly consistent with our main results in Table 2 ($\beta = -0.377$, $p = 0.012$ for *High-level achieved political ties*; $\beta = 1.422$, $p = 0.006$ for *Low-level achieved political ties,* $\beta = -3.572$, $p = 0.019$ for *High-level achieved political ties × Owner's social class,* $\beta = -1.175$, $p = 0.016$ for *Low-level achieved political ties × Owner's social class,* $\beta = -5.543$, $p = 0.080$ for *High-level achieved political ties × High-level environmental attention*), except for Hypothesis 6 ($\beta = 0.200$, $p = 0.663$ for *Low-level achieved political ties × Low-level economic attention)*. Second, we also use the amount of pollution levy paid by a firm as scaled by assets instead of sales (e.g., Maung, Wilson, & Tang, 2016). These yielded robust findings for all hypotheses ($\beta = -0.688$, $p = 0.007$ for *High-level achieved political ties*; $\beta = 0.378$, $p < 0.001$ for *Low-level achieved political ties,* $\beta = -0.680$, $p = 0.006$ for *High-level achieved political ties × Owner's social class,* $\beta = -0.450$, $p < 0.001$ for *Low-level achieved*

political ties × Owner's social class, β = -0.893, *p* = 0.074 for *High-level achieved political ties × High-level environmental attention and β* = 0.205, *p* = 0.023 for *Low-level achieved political ties × Low-level economic attention*).

Alternative Specification of Selected Explanatory Variables

In our main analysis, the cut off we used to determine whether a tie is to a low- or high-level is between the prefectural and provincial levels, i.e., provincial and above are high whereas prefectural and below are low. Arguably, the levels that are closest to the cut-off would be the ones that are most ambiguous to classify. Based on this idea, we dropped observations for firms that have ties to the prefectural and provincial levels from our sample and re-ran our models, now using a low-level tie measure that consists only of ties to the county and township governments, and a high-level tie measure that consists only of ties to the national government. This yielded results that are mostly consistent with our main findings (*High-level achieved political ties: β* = -0.922 and *p* = 0.050; *Low-level achieved political ties: β* = 0.428, *p* < 0.001; *High-level achieved political ties × Owner's social class: β* = -0.725, *p* = 0.053; *Low-level achieved political ties × Owner's social class: β* = -0.370, *p* < 0.001; *Low-level achieved political ties × Low-level economic attention: β* = 0.160, *p* = 0.077), except for Hypothesis 5 (*High-level achieved political ties × High-level environmental attention: β* = -0.954, *p* = 0.403).

We also explored an approach where we did not aggregate ties at different levels into high- or low-level ties. In particular, we re-ran our models using five separate indicator variables, one for ties to each level of government, which equals 1 if an owner has a tie to that level of the government and 0 otherwise. In line with our predictions, the coefficients of the dummy variable that capture ties to the provincial and national level were both negative and jointly significant (*p* = 0.020), and the dummy variables that capture ties to the prefectural, county, and township levels were all positive and jointly significant (*p* < 0.001).

Furthermore, as we have mentioned, for the 44 (0.65% of total observations) cases in our sample where firms have both high-level and low-level ties, in our main analyses we used the highest level to categorize the level of the firm's political ties. To check the sensitivity of our findings to this way of treating such rare cases, we used three alternative approaches, continuing to find results that mostly supported both of our hypotheses, as specified in the parentheses: (a) we used the lowest level instead to categorize the level of these firms' political ties (*β* = -0.503, *p* = 0.035 for High-level achieved political *ties; β* = 0.360, *p* < 0.001 for *Low-level achieved political ties*; *β* = -0.709, *p* = 0.004 for *High-level achieved political ties × Owner's social class; β* = -0.397, *p* < 0.001 for *Low-level achieved political ties ×*

Owner's social class; $\beta = -0.864$, $p = 0.154$ for *High-level achieved political ties × High-level environmental attention;* $\beta = 0.158$, $p = 0.047$ for *Low-level achieved political ties × Low-level economic attention*), (b) we coded these firms as having both high- and low-level ties ($\beta = -0.509$, $p = 0.033$ for *High-level achieved political ties*; $\beta = 0.360$, $p < 0.001$ for *Low-level achieved political ties*; $\beta = -0.709$, $p = 0.004$ for *High-level achieved political ties × Owner's social class;* $\beta = -0.397$, $p < 0.001$ for *Low-level achieved political ties × Owner's social class;* $\beta = -0.864$, $p = 0.154$ for *High-level achieved political ties × High-level environmental attention;* $\beta = 0.158$, $p = 0.047$ for *Low-level achieved political ties × Low-level economic attention*), and (c) we removed these observations from our estimation sample ($\beta = -0.521$, $p = 0.030$ for *High-level achieved political ties;* $\beta = 0.369$, $p < 0.001$ for *Low-level achieved political ties*; $\beta = -0.709$, $p = 0.004$ for *High-level achieved political ties × Owner's social class;* $\beta = -0.397$, $p < 0.001$ for *Low-level achieved political ties × Owner's social class;* $\beta = -0.864$, $p = 0.154$ for *High-level achieved political ties × High-level environmental attention;* $\beta = 0.158$, $p = 0.047$ for *Low-level achieved political ties × Low-level economic attention*).

Finally, we measured our moderator, *High-level Environmental Attention*, using a squared distance decay function. To test the sensitivity of this measure, we also applied a log distance decay function and re-ran our models. The results provide strong and consistent support for all hypotheses ($\beta = -0.488$, $p = 0.023$ for *High-level achieved political ties;* $\beta = 0.373$, $p < 0.001$ for *Low-level achieved political ties*; $\beta = -0.638$, $p = 0.002$ for *High-level achieved political ties × Owner's social class;* $\beta = -0.388$, $p < 0.001$ for *Low-level achieved political ties × Owner's social class;* $\beta = -0.689$, $p = 0.047$ for *High-level achieved political ties × High-level environmental attention;* $\beta = 0.158$, $p = 0.046$ for *Low-level achieved political ties × Low-level economic attention*).

Table B1

Robustness: Two-stage Heckman Selection Models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
				Selection High-level Achieved Ties							Selection Low-level Achieved ties			
	First-stage (Probit)			Second-stage				First-stage (Probit)			Second-stage			
Constant	-3.767†	-1.235	-1.592	-1.543	-1.143	-1.236	-1.931	-1.113	-2.082	-2.291	-2.840	-2.024	-2.076	-3.110
	(2.120)	(2.668)	(2.668)	(2.660)	(2.670)	(2.669)	(2.659)	(0.972)	(2.190)	(2.190)	(2.194)	(2.192)	(2.190)	(2.195)
Control variables	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included
Owner's social class	0.197***	-0.306*	-0.268*	-0.166	-0.308*	-0.306*	-0.105	0.162***	-0.285***	-0.258***	-0.121	-0.285***	-0.296***	-0.081
	(0.045)	(0.121)	(0.122)	(0.128)	(0.121)	(0.121)	(0.130)	(0.020)	(0.073)	(0.074)	(0.088)	(0.073)	(0.073)	(0.091)
High-level environmental attention	-0.181†	0.345**	0.328**	0.337**	0.353**	0.344**	0.321*	0.032	-0.058	-0.056	-0.049	-0.054	-0.062	-0.045
	(0.093)	(0.126)	(0.126)	(0.125)	(0.126)	(0.126)	(0.125)	(0.033)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)
High-level economic attention	-9.885	15.163	14.310	15.423	15.339	15.113	14.562	2.988	-9.842	-9.458	-8.464	-9.778	-9.058	-7.060
	(13.789)	(16.255)	(16.249)	(16.232)	(16.265)	(16.254)	(16.229)	(6.189)	(13.639)	(13.619)	(13.644)	(13.647)	(13.653)	(13.642)
Geographic distance to high-level government	0.294*													
	(0.123)													
High-speed rail								-0.154**						
								(0.058)						
Inverse Mills ratio		-2.105**	-1.990**	-2.047**	-2.121***	-2.101**	-1.913**		-3.122***	-3.018***	-2.655***	-3.130***	-3.198***	-2.558***
		(0.644)	(0.645)	(0.640)	(0.644)	(0.644)	(0.641)		(0.542)	(0.544)	(0.552)	(0.542)	(0.541)	(0.556)
High-level achieved political ties		-0.385†	0.025	-0.488*	-0.578*	-0.384†	-0.170		-0.356†	0.034	-0.465*	-0.558*	-0.349†	-0.183
		(0.212)	(0.268)	(0.217)	(0.240)	(0.212)	(0.286)		(0.212)	(0.274)	(0.217)	(0.236)	(0.212)	(0.288)
Low-level achieved political ties		0.335***	0.324***	0.408***	0.336***	0.336***	0.403***		0.365***	0.356***	0.423***	0.366***	0.361***	0.415***
		(0.090)	(0.090)	(0.091)	(0.089)	(0.090)	(0.091)		(0.087)	(0.087)	(0.089)	(0.087)	(0.087)	(0.089)
High-level achieved political ties x Owner's social class			-0.578**				-0.714***			-0.536*				-0.656**
			(0.208)				(0.213)			(0.212)				(0.216)
Low-level achieved political ties x Owner's social class				-0.352***			-0.388***				-0.298***			-0.328***
				(0.085)			(0.086)				(0.085)			(0.086)
High-level achieved political ties x High-level environmental attention					-0.739†		-0.693†					-0.753†		-0.721†
					(0.389)		(0.371)					(0.396)		(0.378)
Low-level achieved political ties x Low-level economic attention						0.016	0.012						0.184*	0.168*
						(0.089)	(0.089)						(0.079)	(0.079)
Year Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Province Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Number of Observations	6127	6127	6127	6127	6127	6127	6127	6758	6758	6758	6758	6758	6758	6758
Log Pseudo-likelihood	-638.6	-7787.7	-7784.7	-7779.3	-7786.6	-7787.7	-7773.8	-3556.5	-8529.3	-8526.8	-8523.3	-8528.2	-8526.6	-8516.2
F-statistic		15.83***	15.73***	16.08***	15.66***	15.64***	15.66***		17.03***	16.91***	17.08***	16.85***	16.89***	16.70***
Chi-squared	328.580***							1282.416***						

Notes: In all models, the same set of control variables are included as those that are included in the models presented in Table 2 in the main manuscript. Complete models, including all the coefficients for the control variables are available from the Authors. Robust standard errors are in parentheses. Financial/accounting measures are winsorized at 99%. All tests are two-tailed: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table B2

Robustness: Propensity Score Matching Models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	High-level achieved ties as treatment						Low-level achieved ties as treatment					
Constant	-6.067**	-6.199**	-6.249**	-6.021**	-6.058**	-6.380**	-6.395**	-6.491**	-6.566**	-6.352**	-6.466**	-6.723**
	(2.212)	(2.210)	(2.209)	(2.214)	(2.211)	(2.206)	(2.071)	(2.069)	(2.070)	(2.072)	(2.071)	(2.069)
Control variables	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included	All included
Owner's social class	0.075†	0.094*	0.210***	0.076†	0.075†	0.249***	0.076†	0.095*	0.209***	0.077†	0.075†	0.244***
	(0.045)	(0.046)	(0.058)	(0.045)	(0.045)	(0.060)	(0.044)	(0.045)	(0.057)	(0.044)	(0.044)	(0.059)
High-level environmental attention	-0.009	-0.009	-0.008	-0.005	-0.009	-0.004	0.000	0.001	0.002	0.005	-0.002	0.004
	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)	(0.072)	(0.073)	(0.073)	(0.072)
Low-level economic attention	-0.042	-0.041	-0.039	-0.042	-0.052	-0.044	0.027	0.028	0.030	0.028	-0.041	-0.032
	(0.076)	(0.076)	(0.076)	(0.076)	(0.086)	(0.086)	(0.071)	(0.071)	(0.071)	(0.071)	(0.082)	(0.082)
High-level achieved political ties	-0.421†	0.040	-0.528*	-0.602*	-0.420†	-0.143	-0.526*	-0.047	-0.629**	-0.729**	-0.523*	-0.251
	(0.217)	(0.273)	(0.221)	(0.242)	(0.217)	(0.288)	(0.215)	(0.274)	(0.219)	(0.246)	(0.215)	(0.290)
Low-level achieved political ties	0.336***	0.325***	0.413***	0.337***	0.337***	0.409***	0.375***	0.363***	0.445***	0.375***	0.371***	0.435***
	(0.089)	(0.089)	(0.090)	(0.088)	(0.089)	(0.090)	(0.088)	(0.088)	(0.089)	(0.087)	(0.088)	(0.089)
High-level achieved political ties x Owner's social class		-0.650**				-0.793***		-0.652**				-0.782***
		(0.213)				(0.217)		(0.209)				(0.213)
Low-level achieved political ties x Owner's social class			-0.367***			-0.405***			-0.366***			-0.399***
			(0.085)			(0.086)			(0.084)			(0.085)
High-level achieved political ties x High-level environmental attention				-0.691†		-0.657†				-0.751†		-0.712†
				(0.385)		(0.370)				(0.417)		(0.392)
Low-level achieved political ties x Low-level economic attention					0.025	0.019					0.154†	0.142†
					(0.089)	(0.088)					(0.080)	(0.079)
Year Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Province Fixed Effects	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Number of Observations	6182	6182	6182	6182	6182	6182	6715	6715	6715	6715	6715	6715
Log Pseudo-likelihood	-7864.9	-7861.3	-7855.8	-7864.0	-7864.9	-7849.4	-8475.7	-8472.0	-8466.4	-8474.7	-8473.8	-8458.5
F-statistic	16.24***	16.13***	16.50***	16.06***	16.04***	16.06***	17.32***	17.21***	17.50***	17.15***	17.16***	17.10***

Notes: In all models, the same set of control variables are included as those that are included in the models presented in Table 2 in the main manuscript. Complete models, including all the coefficients for the control variables are available from the Authors. Robust standard errors are in parentheses. Financial/accounting measures are winsorized at 99%. All tests are two-tailed: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table B3

Robustness: Three-stage-least-squares Models

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-0.114	-0.164	-0.178	-0.100	-0.160	-0.275
	(0.846)	(0.846)	(0.846)	(0.847)	(0.846)	(0.845)
Control variables	All included	All included	All included	All included	All included	All included
Owner's social class	0.014	0.023	0.057**	0.014	0.013	0.071**
	(0.018)	(0.019)	(0.022)	(0.018)	(0.018)	(0.022)
High-level environmental attention	0.003	0.004	0.005	0.004	0.001	0.005
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
Low-level economic attention	0.037	0.036	0.037	0.037	-0.004	-0.003
	(0.029)	(0.029)	(0.029)	(0.029)	(0.032)	(0.032)
High-level achieved political ties	-0.177†	0.035	-0.213*	-0.189†	-0.177†	0.015
	(0.104)	(0.127)	(0.104)	(0.106)	(0.104)	(0.129)
Low-level achieved political ties	0.138***	0.132***	0.162***	0.138***	0.137***	0.157***
	(0.039)	(0.039)	(0.040)	(0.039)	(0.039)	(0.040)
High-level achieved political ties x Owner's social class		-0.302**				-0.343**
		(0.104)				(0.104)
Low-level achieved political ties x Owner's social class			-0.134***			-0.147***
			(0.037)			(0.037)
High-level achieved political ties x High-level environmental attention				-0.070		-0.057
				(0.127)		(0.127)
Low-level achieved political ties x Low-level economic attention					0.102**	0.099**
					(0.034)	(0.034)
Year Fixed Effects	Included	Included	Included	Included	Included	Included
Industry Fixed Effects	Included	Included	Included	Included	Included	Included
Province Fixed Effects	Included	Included	Included	Included	Included	Included
Number of Observations	6682	6682	6682	6682	6682	6682
R-squared	0.129	0.130	0.131	0.129	0.130	0.133
Chi-squared	990.303***	1000.057***	1005.447***	990.653***	1000.560***	1028.421***

Notes: In all models, the same set of control variables are included as those that are included in the models presented in Table 2 in the main manuscript. Complete models, including all the coefficients for the control variables are available from the Authors. Robust standard errors are in parentheses. Financial/accounting measures are winsorized at 99%. All tests are two-tailed: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Due to space limits, detailed results of the other two stages of the three-stage-least square models will be provided upon request.

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