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Collusive versus coercive corporate corruption: evidence from demand-side shocks and supply-side disclosures

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Abstract

We examine whether and how collusive and coercive forms of corporate corruption influence firm value. Our identification strategy exploits (i) the exogenous criminal prosecutions of regional government officials as part of China's anti-corruption campaign as demand-side shocks and (ii) the unique reporting of entertainment and travel costs by Chinese firms as supply-side disclosure of corruption-related spending. Among firms for which corruption is likely to be perceived as collusive (coercive) by investors, we find that exposure to corruption-related political risk measured by abnormal entertainment and travel costs has a significantly negative (positive) relation with market reactions to the anti-corruption prosecutions. These findings are consistent with investors' anticipation of a future decline in potential benefits (costs) arising from rent-sharing collusion (rent-extracting coercion). We also find that the collusion (coercion) effect is more pronounced for firms in regions with greater government economic intervention (in industries with stronger business competition). Furthermore, we provide evidence that the ex ante market reactions corroborate with the direction of changes in ex post operating performance of firms. Overall, our results suggest that investors can recognize differences in the economic consequences between collusive and coercive corruption and that the disclosure of corruption-related spending could help investors assess a firm's exposure to corruption-related risk.

Keywords Corporate corruption · Anti-corruption campaign · Corporate disclosure · Market reactions

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1 Introduction

This study examines whether and how firm value can be influenced differently by collusive and coercive forms of corporate corruption.[1] To this end, we draw on exogenous demand-side shocks based on corrupt officials' prosecutions and supply-side disclosure of corruption-related corporate spending. Corporate corruption can occur in at least two ways (Shleifer and Vishny 1993; Shleifer 2004). First, a firm could bribe corrupt officials to decrease payments to the government (e.g., taxes and tariffs) that would otherwise be charged at a normal rate. This helps reduce the overall costs for the firm through rent sharing with public officials (Bertrand et al. 2007; Olken 2009). Second, a firm may have to bribe corrupt officials to influence the outcomes of government decisions (e.g., the issuance of permits and licenses) that should otherwise be made without additional payment. This increases the overall costs for the firm due to rent extraction by public officials (Foellmi and Oechslin 2007; Olken and Barron 2009). From the perspective of the corrupt officials, the first form can be considered as corruption with theft in that it directly reduces government income, and the second form can be perceived as corruption without theft in that it doesn't directly affect government income (Shleifer and Vishny 1993; Shleifer 2004). From the perspective of firms, the first form of corporate corruption can be considered as a *collusion* with corrupt officials, whereas the second form can be perceived to be a *coercion* by these officials (Bardhan 1997; Sequeira and Djankov 2014; Sequeira 2016). Collusive versus coercive corporate corruption differ in their implications for firms and underlying theoretical rationale. Surprisingly, however, the academic literature provides only limited evidence on their heterogeneous effects on shareholder wealth. To fill this research gap, our study aims to provide systematic evidence on this under-researched issue, focusing on the differential economic consequences of collusive versus coercive corporate corruption.

The importance of our study stems from the prevalence of corporate corruption around the world. For instance, a World Bank survey conducted in 142 countries found that around 17.2% of firms received requests for bribes and nearly 25.8% of firms were expected to pay bribes to secure government contracts (World Bank 2019). Based on a broad estimate by the International Monetary Fund (IMF), the global annual cost of bribery is around US$1.5 trillion to $2 trillion (IMF 2016). Nevertheless, this topic is difficult to examine empirically because the demand for and supply of corruption and bribery are not easily observable on a large sample basis.[2] One stream of the corruption literature has adopted the macroeconomic or institutional perspective, focusing on the political, economic, and cultural antecedents of bribery (Mauro 1995; Ades and Di Tella 1999; Jha et al. 2020). Another stream of the literature has attempted to examine corruption through micro or firm data, but these studies are subject to limitations. For

[1] The form of corporate corruption that we examine in this study is the corrupt relationships between businesses (supply-side) and government officials (demand-side), rather than the corrupt relationships either within or between businesses (Castro et al. 2020).

[2] Although "corruption" can refer to a broader range of behavior than just bribery, we use the term to refer specifically to bribery.

instance, the inference through experimental methods (Bertrand and Mullainathan 2001) may not necessarily hold when real world conditions vary (Kachelmeir and Towry 2005), and the findings of surveys (Fisman and Svensson 2007; Serafeim 2014) can be affected by respondent biases (Bertrand and Mullainathan 2001). Studies based on self-reported anti-corruption initiatives (Healy and Serafeim 2016) can be confounded by corporate disclosure incentives, and those associated with small samples of actual cases from which criminal prosecution data have been obtained can be subject to self-selection bias (Cheung et al. 2012).

Unlike previous studies, our identification strategy exploits and combines two unique institutional settings in mainland China to capture variations in the demand and supply sides of corporate corruption. On the demand side of corporate corruption, we treat a set of high-profile prosecutions of corrupt regional officials that occurred between 2012 and 2015 across 31 regions (i.e., 27 provinces and four province-level municipalities) as exogenously induced political shocks that affect requests for corporate bribery or demand for corporate corruption. These staggered demand-side shocks, that is, public announcements of anti-corruption prosecutions, provide a natural experimental setting that enables analysis of the share price responses to exogenous variation in corruption-related political uncertainty. Event studies are a well-established approach in empirical research to assess investors' perceptions of news associated with corporate or government policy decisions (Schwert 1981), and this research design is also less subject to potential endogeneity (Larcker and Rusticus 2010; Roberts and Whited 2013). Recent event studies of the anti-corruption reforms in China based on the initiation of the *national* anti-corruption campaign provide at best mixed results (Ke et al. 2018; Lin et al. 2018).[3] Unlike these previous studies, our analysis is based on staggered occurrences of multiple *regional* events, enabling us to separately identify observations pertaining to our treatment and control groups.[4]

On the supply side of corporate corruption, we use the accounting disclosure of entertainment and travel costs in firms' financial statements to estimate firm-specific exposure to corruption-related political risk across a large sample of firm-year

[3] Although Lin et al. (2018) and Ke et al. (2018) both examine the market reaction to Chinese President Xi Jinping's announcement on December 4, 2012, to launch the national-level anti-corruption campaign, the former study finds a positive effect and the latter finds no evidence of an effect. The analyses based on this single event date may not generate strong and reliable inferences for two reasons. First, the Chinese central government has a long history of announcing anti-corruption reforms, beginning well before 2012, and similar announcements in the past did not necessarily lead to prosecutions. As such, the market was unlikely to be surprised by the 2012 announcement, and it is with the benefit of hindsight that we now appreciate its policy significance. Second, on the same date that President Xi announced the anti-corruption campaign, the Chinese Security Regulatory Commission also made an important policy announcement regarding a set of stock market reforms (http://jingji.cntv.cn/2012/12/04/ARTI1354585707083333.shtml). Thus it would be difficult to determine whether it is the anti-corruption campaign or the stock exchange reforms driving the observed market reactions on the shared event date.

[4] There is media speculation that anti-corruption charges tend to target regional officials that have either fallen out of favor with or are opponents of the central government's leaders (https://www.washingtonpost.com/world/asia_pacific/in-china-investigations-and-purges-become-the-new-normal/2018/10/21/077fa736-d39c-11e8-a275-81c671a50422_story.html). Accordingly, market reactions to actual prosecutions of regional officials could be affected not only by anticipation of a reduction in corruption demand but also by expectations of increased political costs. Nevertheless, the latter effect is expected to exert a stronger negative impact on the firm value of non-state-owned enterprises than that of state-owned enterprises, and this would thus introduce into our study a *conservative* bias against finding evidence supporting our hypotheses.

observations. Studies consistently apply abnormal entertainment and travel costs (i.e., the difference between actual and expected level of entertainment and travel costs) as a proxy for *alleged* bribery expenditure (e.g., Cai et al. 2011; Zeng et al. 2016; Xu et al. 2018). Extracting corruption-related expenses, such as abnormal entertainment and travel costs, from accounting information disclosed in financial statements allows us not only to avoid the respondent biases found in survey-based studies (Bertrand and Mullainathan 2001) but also to control for potential confounding effects related to managerial incentives for voluntary disclosure (Beyer et al. 2010; Leuz and Wysocki 2016). Moreover, our abnormal entertainment and travel costs measure is less likely to be confounded by macroeconomic or institutional factors unrelated to corporate corruption, compared to other proxies for propensity to pay bribes estimated on a firm-level data, such as the level of business and revenue exposure to corrupt regions (Zeume 2017).

We predict that firms on the supply side of collusive (coercive) corruption experience a valuation discount (premium) upon negative demand-side shocks, that is, exogenous decreases in the demand for corruption. When investors perceive that a firm's corruption is motivated by collusion, they would consider that corruption-related spending by the firm to be *value-adding* in that it creates more opportunities for rent sharing with corrupt officials and thus brings about opportunities for business cost reductions. However, the prosecution of corrupt officials would weaken the demand for this collusion and reduce the future benefit that the firm could gain; investors then may respond unfavorably to these prosecutions, leading to a negative relation between the level of corruption-related political risk exposure and the market reactions to news of prosecutions of corrupt officials in the region where firms are headquartered. On the other hand, when investors believe that a firm's corruption is driven by coercion, they would perceive corruption-related spending by the firm to be *value-destroying* or *nonvalue-adding* in that it represents more pressure for rent extraction by corrupt officials and a stronger disadvantage in overall business cost escalations. Therefore, the prosecution of corrupt officials would decrease the demand for coercion and reduce the firm's future costs. Investors might then react favorably to these prosecutions, driving a positive relation between the level of corruption-related political risk exposure and the share price responses to news of the prosecution of corrupt local officials.

To test our assertion, we first divide Chinese-listed firms, based on ownership, into state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs). We then consider SOEs and non-SOEs as suspect firms whose corporate corruption is likely perceived by investors as collusive and coercive, respectively. Under Chinese-style state capitalism (Allen et al. 2005; Wong 2016), SOEs differ from non-SOEs in at least two important ways. First, the government decides the appointment and turnover of executives in SOEs (Kato and Long 2006; Ke et al. 2012), and these executives are administratively similar to other officials in the state bureaucracy. As such, the government-to-business revolving door relation is far stronger in SOEs than in non-SOEs (Lin and Milhaupt 2013; Milhaupt 2020). The literature suggests that revolving door relations benefit firms via closer interactions with regulators (Lester et al. 2008; Goldman et al. 2009). Second, the government financially supports SOEs through preferential loans from state-owned banks and direct subsidies (e.g., Chen et al. 2010a; Gan et al. 2018). This incentivizes officials to ensure the success and survival of SOEs to justify the allocation of state resources (Steinfeld 2000; Leutert 2018). Similarly,

studies provide evidence that the promotion of government officials in China is strongly linked with the performance of firms under their jurisdiction (Piotroski et al. 2015; Lyu et al. 2018).

The institutional background of China described above supports the assumption of SOEs (non-SOEs) as firms suspected of collusive (coercive) corporate corruption in our research design. Due to stronger government-to-business revolving door relations and state financial support, SOEs have more opportunities to engage in rent-sharing with corrupt officials (Aharoni 1986; Leutert and Vortherms 2021). The innate government ties enjoyed by SOEs could also deter to coercive exploitation by other officials that often exists for non-SOEs. For the above reasons, outside investors are more likely to perceive corporate corruption in the majority of the SOEs to be rooted in collusion with corrupt officials, though some SOEs with relatively weak political connections (and thus weak deterrence against coercion) might also engage in corruption as a result of coercion.

In sharp contrast, non-SOEs generally have no (or relatively weaker) innate government ties and thus weaker deterrence against rent-extracting coercion. As a result, they are more susceptible to coercion or extortion by corrupt officials, compared to SOEs (Che 2002; Chen et al. 2013). The lack of government ties might also render non-SOEs less attractive than SOEs for corrupt officials to offer rent-sharing collusion opportunities in exchange for additional forms of reciprocation such as the promotion of their political careers. As such, investors are likely to perceive coercive corruption to be the prevalent form of corporate corruption among such non-SOEs, though some of these firms with strong political connections may also engage in collusive corruption. Drawing on the above discussion, we expect to observe the following. To the extent that the prosecution of corrupt officials reduces the demand for both collusive and coercive corporate corruption, the negative impact from the anti-corruption prosecutions (i.e., a reduction in rent-sharing collusion opportunities) is stronger for SOEs than for non-SOEs, while the associated positive effect (i.e., a reduction in rent-extracting coercive pressure) is more pronounced for non-SOEs than for SOEs.

We find results consistent with our expectations. First, for a given level of abnormal entertainment and travel costs, we find that, for SOEs (i.e., suspect firms that are likely perceived to engage in collusive corruption), the share prices react *negatively* to the news of corrupt officials being prosecuted in the regions where the firms are headquartered. This suggests that investors perceive the rent-sharing collusive corruption to be value-adding and interpret its reduction arising from these prosecutions as bad news, thereby leading to a negative market reaction. In marked contrast, for a given level of abnormal entertainment and travel costs, we find that, for non-SOEs (i.e., suspect firms that are likely perceived to engage in coercive corruption), the market reacts *positively* to the prosecutions of corrupt officials in the regions where the firms are domiciled. This suggests that rent-extracting coercive corruption is value-destroying and its reduction thus leads to a positive market reaction for non-SOEs. Stated another way, among SOEs (non-SOEs) suspected of collusive (coercive) corruption, we find that abnormal entertainment and travel costs, which capture a firm's exposure to corruption-related political risk, are negatively (positively) associated with the stock price responses to anti-corruption prosecutions. The above findings, taken together, suggest that corruption-related political risk can exert heterogeneous impacts on shareholder wealth, depending on whether it is associated with collusion or coercion, and

that reporting of corruption-related spending, such as entertainment and travel costs, conveys useful information about a firm's exposure to such risk. Our results are robust to a variety of sensitivity tests, which include controlling for firms' governance characteristics and performance, year and industry fixed effects, the use of alternative benchmarks to estimate abnormal stock returns, and placebo event tests.[5]

Second, we evaluate the conditioning effects of two primary antecedents of corporate corruption based on the relevant literature: (i) the degree of government intervention in the economy and (ii) the intensity of business competition in the industry. Studies suggest that government economic intervention could escalate corporate corruption (Leff 1964; Buchanan 1980) because officials with greater discretionary power can better bend rules and transfer resources (Shleifer and Vishny 1994; Acemoglu and Verdier 2000). The literature also argues that business competition could incentivize corporate corruption (Bliss and Di Tella 1997; Emerson 2006), because corrupt practices may help firms outperform peers (Rose-Ackerman 1978; Ades and Di Tella 1999). On the one hand, we find that the negative relation between share price responses to corrupt officials' prosecution and abnormal entertainment and travel costs among suspect firms of collusive corruption (i.e., SOEs) is more pronounced in regions with greater government intervention but not in industries with higher business competition. This finding comports with the view that collusive corruption entails stronger rent-sharing advantages for SOEs when corrupt officials are more powerful. On the other hand, we find that the positive association between market reactions triggered by the prosecutions and abnormal entertainment and travel costs among suspect firms of coercive corruption (i.e., non-SOEs) is stronger in industries with high business competition but not in regions with greater government intervention. This finding is consistent with the view that non-SOEs face stronger rent-extraction pressure from corrupt officials in the environment of higher business competition.

Third, to verify our findings, we also carry out a difference-in-differences analysis to compare the changes in net profit margins between firms that may be suspected to be more or less corrupt (based on abnormal entertainment and travel costs) and evaluate whether the share price responses correctly predict the impact on anti-corruption prosecutions on profit margins. Here our analysis focuses on firms' net profit margins because this measure captures the effects of corruption on business costs, which are affected differently by collusive and coercive corruption at the firm level. Among the firms that are likely suspected of collusive (coercive) corruption, that is, SOEs (non-SOEs), we observe a significant fall (rise) in the net profit margin following the prosecution of corrupt regional officials. We maintain that rent-sharing collusion leads to a decrease in business costs, whereas rent-extracting coercion causes an increase in these costs. Under this maintained assumption, our findings are consistent with the view that a decline in the demand for corporate corruption (caused by the prosecution of corrupt officials) reduces the cost management efficiency among firms likely to engage in collusive corruption (i.e., SOEs), whereas it helps to improve efficiency among firms likely to engage in coercive corruption (i.e., non-SOEs).

[5] The arguments that (i) the market is not informationally efficient, (ii) the estimation of firm-specific corruption-related political risk is very noisy, and (iii) the prosecuted officials may not be sufficiently influential to affect investor behavior all suggest our empirical analysis is biased against finding evidence in support of our predictions.

Lastly, we perform a variety of robustness tests to provide additional evidence in support of our baseline results. We examine whether the influence of firm-specific political connections differs systematically between SOEs and non-SOEs. We find that political connections significantly strengthen the effects of collusive corruption among SOEs, while it weakens the effects of coercive corruption among non-SOEs. This finding lends further support to our approach of treating SOEs (non-SOEs) as suspect firms of collusive (coercive) corruption since SOEs (non-SOEs) generally have stronger (weaker) political affiliations in the institutional environment we examine. Regarding cross-sectional variation in level of abnormal entertainment and travel costs, we acquire evidence that our baseline findings are significant when abnormal entertainment and travel costs are positive but insignificant when they are negative. This evidence lends further support to our use of entertainment and travel costs to estimate corruption-related spending, since it is the level of this measure *above* (rather than below) the expected level that could capture bribery by firms. We also examine and compare over-time changes in abnormal entertainment and travel costs from before to after the anti-corruption prosecutions and find a significant reduction in both the level and volatility of this measure. This evidence lends further support to our use of prosecutions as negative demand-side shocks to corporate corruption in the sense that these events are followed by a decline of abnormal entertainment and travel costs.

Our study contributes to two strands of literature. First, for the corporate corruption literature, our study informs the ongoing debate on whether corporate corruption hampers (Rose-Ackerman 1998; Fisman and Svensson 2007) or facilitates (Acemoglu and Verdier 2000; Krammer 2019) economic activities. For instance, in the context of economic development arising from investments by foreign firms, some studies document that corporate corruption can be detrimental (Mauro 1995; Cuervo-Cazurra 2006), whereas others find that it is beneficial (Egger and Winner 2005; Mendez and Sepulveda 2006). Our evidence suggests that investors recognize that the economic consequences of corporate corruption, in particular, its impact on shareholder wealth, differ systematically between rent-sharing collusion and rent-extracting coercion (Shleifer and Vishny 1993; Sequeira and Djankov 2014; Sequeira 2016), and that these effects can be separately influenced by antecedents of corruption associated with government economic intervention or business competition (Rose-Ackerman 1978; Shleifer 2004). In other words, our study reveals that investors incorporate corruption-related political risk into their firm valuation decisions. To this extent, our inferences may generalize to jurisdictions beyond China and especially to other developing economies where corporate corruption is widespread.

Second, our study adds to the accounting literature on the social benefit of mandatory disclosure (Verrecchia 1990; Beyer et al. 2010). We show that mandatory disclosure of corruption-related expenses, such as entertainment and travel costs, is beneficial in that managers are inherently more reluctant to disclose this information voluntarily than other less controversial information, as predicted by the "unravelling result" argument (Grossman 1981; Dye 2017). Our evidence reveals that these expenses can convey useful information regarding firms' exposure to corruption-related political risk and help investors' anticipation this risk to their wealth. Although some accounting studies suggest that the information in financial statements has little effect on firm valuations (Lev and Gu 2016; Lev 2018), our study indicates that mandatory disclosure of certain distinctive accounting items, such as entertainment and travel costs, can assist

investors' valuation decisions in response to external shocks. Although we use China as our setting, our findings offer useful policy implications elsewhere, particularly given the increasing international attention to the role of accounting information in fighting corporate corruption (OECD 2013; IFAC 2017).

The study proceeds as follows. Section 2 reviews the literature, describes the institutional background, and develops our testable hypotheses. Section 3 describes the sample and research design. Section 4 presents our empirical findings. Section 5 concludes.

2 Literature review, institutional background, and hypothesis development

2.1 Collusive versus coercive corporate corruption

Beyond the ethical and legal issues, corruption or bribery can generally be viewed as a kind of business arrangement intended to render both participants (those who demand and supply corruption) better off. Under this perspective the bribee's favorable response to the briber serves as the underlying commodity (Johnson 1985). For the bribee, corruption represents the misuse of public office for private gain (Svensson 2000) and can be defined as "acts in which the power of public office is used for personal gain in a manner that contravenes the rules of the game" (Jain 2001, p. 73). For the briber, corruption helps firms acquire government benefits or gain other advantages (Rose-Ackerman 1990) and can be defined as "the offering, promising, or giving of something in order to influence a public official in the execution of his/her official duties" (OECD 2000, p. 2).

Shleifer and Vishny (1993) argue that corruption is essentially the sale of government services by officials and that these practices can be further classified into cases with and without theft from the perspective of the bribee. In cases with theft, the official sells government services below the normal price and earns the bribe but reduces government income (e.g., by lowering taxes and tariffs). Bribers or buyers who pay bribes to acquire services may, for example, aim to decrease their overall business costs, such that the sum of the actual payment to government and bribery expense would be lower than the original cost of the government service. In the case of corruption without theft, the official sells government services at the normal price and receives a bribe without reducing the government's income (e.g., by issuing of licenses and permits). Firms bribe to enable them to get on with their business operations, despite an increase in their overall cost, with the bribery expenses added to the normal charge for the government service.

From the perspective of bribers, corruption with theft can be considered as *collusion* with corrupt officials, whereas corruption without theft can be perceived as *coercion* by the officials (Bardhan 1997; Sequeira and Djankov 2014; Sequeira 2016). In the case of collusion, firms collude with corrupt officials to share rents and gain the advantage of reduced business costs, such as evasion of tariffs. Studies provide evidence of collusive corruption in the allocation of driver's licenses in India (Bertrand et al. 2007) and road-building projects in Indonesia (Olken 2009). In the case of *coercion*, firms are coerced by corrupt officials to pay bribes just to gain access to certain public services, such as business licensing, and face increased business costs from the extortion. Therefore, coercive corruption could be viewed as rent extraction by corrupt officials. Studies

document coercive corruption among small business entrepreneurs in Peru (De Soto 1989) and among truckers at road posts in Indonesia (Olken and Barron 2009).[6]

In general, corporate corruption can be influenced by two primary antecedents, as identified by the literature: (i) the degree of government economic intervention and (ii) the intensity of business competition. Aidt (2003) suggests that at least two conditions are required for corporate corruption to arise and be sustained for the mutual benefit of the bribee and briber. The first condition is that corrupt officials should have enough authority to adjust relevant regulations and transfer resources in a discretionary manner, and the second condition is that economic rent that must either exist or be created by firms to incentivize corruption. The influence of discretionary power of corrupt officials would to be stronger when there is greater government intervention in economic activities (Leff 1964; Buchanan 1980; Shleifer and Vishny 1994; Acemoglu and Verdier 2000). The effect of economic rent in motivating corporate corruption would be stronger when firms face greater business competition, due to pressure to outperform peers (Rose-Ackerman 1978; Bliss and Di Tella 1997; Ades and Di Tella 1999; Emerson 2006).

2.2 Corporate disclosure of corruption-related information

Although the responsibility of accountants and role of accounting information in fighting against corporate corruption are well articulated (IFAC 2017), limited data availability inhibits large-sample archival analysis to evaluate the determinants and consequences of corporate disclosure on corruption-related information. Lyon and Maher (2005) show that U.S. firms disclosing bribery payments to foreign governments are considered by auditors to be riskier. They used foreign bribery data from 82 firms collected from the voluntary disclosure program of the Securities and Exchange Commission (SEC) before the enactment of the Foreign Corrupt Practices Act in 1977. Healy and Serafeim (2016) examine Transparency International's ratings of self-reported anti-corruption efforts for an international sample of 480 firms. They show that the ratings relate to factors, such as legal enforcement, country and industry corruption risk, and monitoring and governance effectiveness, and conclude that self-reported anti-corruption efforts by firms signal their intention to combat corruption.

[6] In general, the framework of collusive versus coercive corruption stipulates that the former is motivated by rent-sharing opportunities with corrupt officials that help decrease overall business costs and the latter is motivated by rent-extraction pressure by officials that increases business costs (Alexeev and Song 2013; Sequeira and Djankov 2014; Sequeira 2016). Therefore the question of how a specific instance of corruption is classified as collusive or coercive depends largely on two factors: (i) the incentive that instigates the corruption and (ii) how it affects the briber's overall business costs. For example, in the context of bribery when bidding for government contracts or to hurt competitors, collusion would arise when an unqualified bidder or underperforming firm bribes corrupt officials to win the contract or prevent the leading bidder from winning, even without the briber's substantial further investment to qualify for the bid or outperform the competitors. In such contexts, coercion would occur when the leading bidder must still offer bribery to corrupt officials to be awarded the contract or to prevent a less qualified and underperforming competitor from winning. It may therefore be difficult to apply the framework of collusive and coercive corruption in cases where it is difficult to identify the underlying incentives and influence on overall business costs. For instance, even without explicit and immediate rent-sharing opportunities or rent-extraction pressures, firms may sometimes still bribe to manage their political costs and policy uncertainty, either on a proactive basis to appease newly appointed officials or on a reactive basis to keep up with similar practices by peers.

Nevertheless, evidence based on such self-reporting could be confounded by managerial incentives as in the case of other studies based on voluntary corporate disclosures.

Other studies evaluate how accounting can be influenced by the presence of corporate corruption. For instance, Jha et al. (2020) find that auditors charge higher fees to firms headquartered in more corrupt districts, based on data related to corruption prosecutions from the U.S. Department of Justice. Their finding suggests that firms in more corrupt regions are more likely to obfuscate information or incur additional risk associated with corruption prosecutions (Xu et al. 2020; Fan et al. 2021). In addition, Hope et al. (2020) find an inverse relation between corruption propensity and financial reporting quality, using variation in the number of politically connected directors as a proxy for corporate corruption propensity. Their findings are also consistent with the inference in the literature that political connections reduce accounting quality (Chen et al. 2010b; Chaney et al. 2011). Although the corruption measures used in these studies could overcome potential bias associated with corporate voluntary disclosure, they do not capture corruption-related information directly supplied by the firms.

2.3 Institutional background

2.3.1 Demand side and supply side of corporate corruption

On the demand side of corporate corruption, the Chinese government has made longstanding efforts to curb corruption by prosecuting corrupt officials (Cole et al. 2009; Zeng et al. 2016).[7] During the 18th National Congress of the Chinese Communist Party in November 2012, the government launched its most high-profile anti-corruption campaign in recent times, and specific guidelines were released on December 4, 2012, with the publication of the "Eight-point Regulation." Since then, over 300,000 central and local government officials have been investigated, with those investigated facing nearly a 99% rate of prosecution (Forbes 2016). Empirical studies have also suggested that this campaign led to a significant reduction in the consumption of luxury goods and services (Ke et al. 2018) and spending on managerial perks (Griffin et al. 2018). The staggered events of corrupt officials' prosecutions across different regions under this campaign provide a quasi-natural experiment setting in which to evaluate the impact of entertainment and travel costs disclosure on the demand side of corporate corruption. An empirical study that draws on this context could alleviate potential endogeneity concerns.

On the supply side of corporate corruption, since 2009 all listed firms in China have been required to disclose their entertainment and travel costs as standard categories of management expenses (*Guan Li Fei Yong* in Chinese) and sales expenses (*Xiao Shou Fei Yong* in Chinese) in their financial statements. Managers must provide receipts for all types of entertainment and travel expenses to seek reimbursement for these items. Cai et al. (2011) suggest that disclosed entertainment and travel costs mainly comprise three components: (i) managerial excess spending, (ii) expenses to build relational capital with clients and suppliers, and (iii) bribes to corrupt officials. The normal entertainment and travel costs of legitimate operations is a function of the first two

[7] Early initiatives include the 1978 establishment of the Central Commission for Discipline Inspection in the Communist Party, the 1989 declaration by the Supreme People's Court to penalize corrupt officials, and the 1995 establishment of the anti-corruption bureau in the Supreme People's Procuratorate.

components, whereas abnormal entertainment and travel costs, that is, the difference between actual and normal entertainment and travel costs, reflect the third component. Accordingly, the literature interprets abnormal entertainment and travel costs as a measure of alleged bribes (e.g., Zeng et al. 2016; Xu et al. 2018; Ruan and Zhang 2021). For example, when two firms have comparable executive remuneration, corporate governance, accounts payable and receivable, and size, the firm with greater abnormal entertainment and travel costs may be more likely to be associated with corporate bribery. In other words, abnormal entertainment and travel costs essentially capture the degree of a firm's exposure to corruption-related political risk.

2.3.2 State-owned versus non-state-owned enterprises

The Chinese stock exchanges comprise two distinct groups of listed firms, SOEs and non-SOEs, which reflects China's policy of maintaining a high level of central planning and coordination in a market-oriented economy (Allen et al. 2005; Wong 2016). Unlike other transitional economies (e.g., Russia) where the state relinquished its ownership in listed SOEs, both central and regional governments in China have listed SOEs under their control to ensure the state influence over economic development (Lin et al. 2020; Milhaupt 2020). The executives of SOEs are administratively equivalent to officials in the state bureaucratic system, and the government retains the power to appoint, dismiss, reward, and penalize them based on their performance (Firth et al. 2006; Ke et al. 2012). This generates a strong government-to-business revolving door that benefits both the firms and officials (Mako and Zhang 2003; Lin and Milhaupt 2013). Because executives of SOEs tend to have powerful backing within the government, they are better able than executives of non-SOEs to protect themselves and deter rent extraction by other officials. These other officials are less prone to exploit SOEs because doing so would directly endanger their own political careers.

The government also offers substantial financial support to SOEs through preferential loans (Chen et al. 2010a) and subsidies (Gan et al. 2018). Because the objectives of such financial support are to promote strategically important sectors and strengthen regional development (Lin et al. 1998; Bai et al. 2006), the appraisals of government officials are strongly linked to the performance of SOEs within their jurisdiction. Research suggests that there is extensive rent sharing between Chinese SOEs and government officials, because the officials rely on these firms to deliver economic performance and the firms' executives in turn rely on the officials for job security (Aharoni 1986; Leutert 2018; Leutert and Vortherms 2021).[8] However, some SOEs

[8] An example of rent-sharing collusion between SOEs and a corrupt official is the case of Zhubing Chen, who was a former director of the Ministry of Finance. On March 21, 2013, he was sentenced to life imprisonment for receiving bribes totaling RMB 24.54 million from various sources. In one case, Chen received RMB 2.2 million in bribes from Gezhouba Group, which is a listed SOE owned by the central government with annual net profit for 2012 of over RMB 1 billion. In return Chen exercised his authority to exempt this firm from over RMB 5 million of interest payments on government loans. In another case, Chen was paid RMB 1.3 million in bribes from Beijing Sanyuan Food Co. Ltd., which is a listed SOE owned by regional government with annual net profit for 2012 of RMB 32.8 million. In exchange Chen used his authority to exempt this firm from payments of over RMB 11.84 million. In these cases, the SOEs received substantial reductions in business costs, and the corrupt official received significant personal gain, all at the expense of government income, which incurred lost interest payments on business loans (http://jjckb.xinhuanet.com/invest/2013-08/09/content_460708.htm).

with weaker firm-specific political connections, such as those headquartered further away from the regional center of political power, may still be subject to rent-extracting coercion by corrupt officials. Nevertheless, the increased business costs incurred in this way could also be compensated indirectly through state financial support received by these firms due to their government ties.

In contrast, non-SOEs in China enjoy more independence in management and ownership than SOEs, and benefit less from the government's "helping hand" (Fry and Shleifer 1997; Shleifer 1998) of state affiliation and support compared to SOEs. The literature confirms that stronger government ties could give firms with greater access to information more influence in the regulatory process (Goldman et al. 2009; Wellman 2017), greater government financial support in the form of bailouts, and less dependence on capital markets (Faccio et al. 2006; Amore and Bennedsen 2013); in these aspects, the non-SOEs are disadvantaged, relative to the SOEs. As such, although the performance of non-SOEs should be driven more by their own efficiency and innovation (Li and Rozelle 2004; Dong et al. 2006), they could be more susceptible to coercion or exploitation by rent-extracting corrupt officials (North 1990; Che 2002). For instance, evidence shows that bribery allows private firms to gain more access to bank lending in China (Chen et al. 2013; Li and Chan 2021), where financial institutions are largely state-owned or influenced by government (Lau et al. 2000; Allen et al. 2005).[9] Although some non-SOEs may establish strong firm-specific political connections by appointing executives with government experience, who may thus attract rent-sharing opportunities to the firm from other officials, such connections are likely to be more transitory than those of SOEs because these executives could leave the firm or their government contacts could change jobs.

2.4 Hypothesis development

We formulate two sets of testable hypotheses based on the literature and our setting. Our first set of hypotheses predicts a valuation discount (premium) for firms on the supply side of collusive (coercive) corporate corruption, following negative demand-side shocks to such practices. Specifically, we view the prosecution of high-profile corrupt officials in the region of China where a firm is headquartered as an exogenous demand-side shock to corporate bribery because it restrains corruption through increased monitoring. For firms that formerly enjoyed business costs reductions through collusive corruption, this demand-side shock would weaken cost-saving advantages, and thus their share price are expected to fall. In contrast, for firms that previously suffered from increased business costs due to coercive corruption, the same demand-

[9] An example of rent-extraction coercion of a non-SOE by a corrupt official is the case of Chint Electric Co. Ltd., a listed company with annual profit for 2014 of over RMB 1 billion. In seeking assistance from local government in Quzhou city, Zhejiang province, to acquire suitable land for solar energy investment projects in 2014, the firm was asked to pay bribes worth over RMB 10 million by Liantu Liu, a former director of the Quzhou Forestry Bureau, to help facilitate the land search process. In this case, the corrupt official acquired significant personal gains, and, although government income was not affected, the firm incurred substantial incremental business costs for soliciting service from a local government authority that is intended to assist business development and promote green energy. In 2019, this official was sentenced to 11 years' imprisonment (https://www.jiemian.com/article/4636846.html).

side shocks would alleviate cost-increasing disadvantages, and thus their share prices are expected to rise.

Because capital market investors cannot directly observe whether a firm engages in corruption and, if so, whether the corruption is collusive or coercive, they are likely to draw on alternative sources of salient information that helps them determine the degree of a firm's exposure to corruption-related political risk. China's accounting disclosure of entertainment and travel costs enables investors to observe the level of a firm's spending that is potentially related to corruption as the supply-side of corruption. After accounting for legitimate components of entertainment and travel costs related to managerial excess spending and expenses for building and maintaining relationships with customers, suppliers, and other stakeholders, investors are likely to perceive firms with higher levels of abnormal entertainment and travel costs as more corrupt.

Regarding whether firms' exposure to such risk is associated with either collusion or coercion, investors' perception could be influenced by the ownership status of Chinese firms (either SOEs or non-SOEs) as a heuristic indicator of the strength of a firm's political connections. Because SOEs (non-SOEs) are associated with a stronger (no or weaker) government-to-business revolving door and greater government financial support, investors may presume that SOEs (non-SOEs) are more likely to engage in collusive (coercive) corruption, on average.

Based on the above arguments, we assume that investors in the Chinese capital market are likely to perceive SOEs (non-SOEs) to be more exposed to corruption-related political risk associated with collusion (coercion) when they have a higher level of abnormal entertainment and travel costs.[10] To this extent, investors could anticipate that the exogenous decline in bribery demand following the prosecution of corrupt regional officials would lead to a greater reduction of advantages (disadvantages) among these firms more exposed to collusion (coercion) in terms of the business cost savings (increases) driven by the corruption. In other words, investors may interpret the prosecution of corrupt officials as bad (good) news for firms that are expected to lose (gain) more from the decrease in rent-sharing collusion (rent-extracting coercion), as illustrated in Fig. 1. Therefore, we propose our first set of hypotheses below, stated in alternative form.

> H1 (H2): *Among suspect firms likely to be perceived by investors as engaging in collusive (coercive) corporate corruption, the level of abnormal entertainment and travel costs is negatively (positively) associated with market reactions to news about the prosecution of corrupt regional officials.*

Our second set of hypotheses predicts that, following adverse demand-side shocks to corporate corruption, the valuation effect for firms on the supply-side of either collusive or coercive corporate corruption is driven by two primary antecedents, as described by the literature, that is, (i) the degree of government economic intervention and (ii) the

[10] The assumption that SOEs (non-SOEs) with higher levels of abnormal entertainment and travel costs are more likely to engage in collusive (coercive) corporate corruption is made on a general basis, and the effect is assumed to dominate, on average, even if the alternative coercion (collusion) may also exist among some firms. The existence of the alternative effect is likely to bias against finding evidence in support of our main prediction.

intensity of business competition. In regions with greater government intervention in economic activities, officials have more discretionary power to bend rules and transfer resources. When corrupt officials are powerful, they are either better at arranging rent sharing with firms that they could collude with or more capable of demanding rent extraction from firms that they can coerce. In industries with stronger competition, firms experience greater pressure to outperform. This may incentivize them to create advantages through rent-sharing with corrupt officials they collude with or to tolerate the disadvantage of rent-extraction by corrupt officials who coerce them.

Based on these arguments, the negative (positive) association between abnormal entertainment and travel costs and market reactions to news of the prosecution of corrupt regional officials is likely to be more pronounced among firms likely to engage in collusive (coercive) corruption if they are either headquartered in regions where there is greater government intervention in economic activities or they pertain to industries where there is more intensive business competition. The theoretical rationale suggests that both conditioning factors could influence the relation between both collusive and

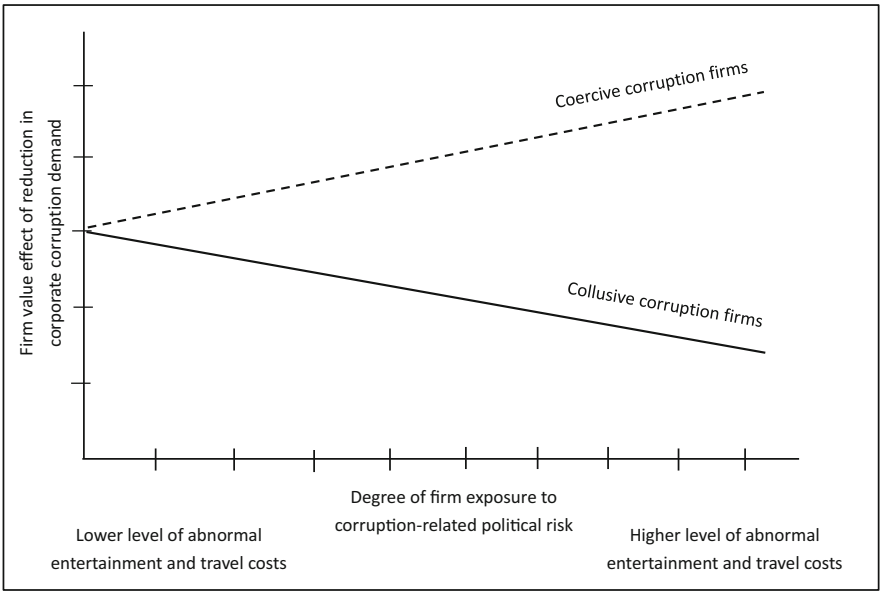

Fig. 1 Differential theoretical effect of exposure to corruption-related political risk on firm value. Note: This figure depicts the differential theoretical effect of a reduction in demand for corporate corruption on firm value for firms with differing exposure to corruption-related political risk and different types of corruption. Anti-corruption prosecutions of corrupt officials in regions in which the firms are based are assumed to be exogenous shocks to the demand-side of corporate corruption. The degree of firm exposure to corruption-related political risk is captured by abnormal entertainment and travel costs, which are disclosed in financial statements of Chinese firms. Among firms more likely to be perceived by investors as engaging in collusive corruption, those with greater abnormal entertainment and travel costs are expected to experience greater value decreases following reductions in opportunity for and benefits of collusive corruption. Among firms more likely to be perceived by investors as engaging in coercive corruption, those with greater abnormal entertainment and travel costs are expected to experience greater value increases following reductions in pressure and costs of coercive corruption

coercive corruption and firm value, but there is no consensus in the literature regarding which conditioning factor is more likely to dominate either form of corruption. In other words, whether government economic intervention or business competition is more likely to drive the effect on firm value of collusive or coercive corruption is ultimately an empirical issue. Drawing upon the above discussions, we propose and test our second set of hypotheses below, stated in alternative form.

> H3 (H4): *Among suspect firms likely to be perceived by investors as engaging in collusive (coercive) corporate corruption, the negative (positive) relation between abnormal entertainment and travel costs and market reactions to news about the prosecution of corrupt regional officials is more pronounced in regions with greater government intervention, industries with stronger business competition, or both.*

3 Research design

3.1 Methodology

To estimate firm-specific exposure to corruption-related political risk, we follow the approach of Cai et al. (2011). They show that entertainment and travel costs disclosed in financial statements are comprised of three components: (i) managerial excess spending, (ii) expenses for building relationships with customers and suppliers, and (iii) expenses for bribes. To empirically extract the third component of entertainment and travel costs from the total value disclosed, we estimate the following regression model, following of Zeng et al. (2016).

$$ETC = \alpha_0 + \alpha_1 ExePay + \alpha_2 OwnCon + \alpha_3 BSize + \alpha_4 AccPay + \alpha_5 AccRcv + \alpha_6 Size + Industry + Year + \varepsilon, \quad (1)$$

where *ETC* refers to a firm's entertainment and travel costs scaled by sales revenue and all explanatory variables are as defined in Table 1, Panel B. Specifically, *ExecPay* (executive pay), *OwnCon* (ownership concentration), and *BSize* (board size) represent three corporate governance characteristics that drive the first component of *ETC*, managerial excess spending. *AccPay* (accounts payables), *AccRcv* (accounts receivables), and *Size* (firm size) are included to capture the second component of *ETC*, that is, expenses incurred to build relationships with customers and suppliers. We include the indicator variables *Industry* and *Year* to control for industry and year fixed effects, respectively. In Eq. (1), the third component of *ETC*, expenses incurred for bribes, are captured by the residual term ε. This residual value reflects the component of *ETC* that exceeds normal *ETC* and is thus assumed to reflect bribery expenditure. This residual estimate is used as our measure of *abnormal* entertainment and travel costs (*AETC*) and proxies for firms' exposure to corruption-related political risk.

We estimate the following two regressions to evaluate market reactions to anti-corruption prosecutions. Equation (2) provides a preliminary test based on total

entertainment and travel costs and Eq. (3) implements our baseline analysis to test hypotheses H1 and H2.

$$CAR = \beta_0 + \beta_1 Treat + \beta_2 SOE + \beta_3 Treat \times SOE + \beta_4 ETC + \beta_5 ETC \times SOE + \beta_6 Treat \times ETC + \beta_7 Treat \times ETC \times SOE + Controls + Industry + Year + \varepsilon; \quad (2)$$

$$CAR = \gamma_0 + \gamma_1 Treat + \gamma_2 SOE + \gamma_3 Treat \times SOE + \gamma_4 AETC + \gamma_5 AETC \times SOE + \gamma_6 Treat \times AETC + \gamma_7 Treat \times AETC \times SOE + \gamma_8 PETC + \gamma_9 PETC \times SOE + \gamma_{10} Treat \times PETC + \gamma_{11} Treat \times PETC \times SOE + Controls + Industry + Year + \varepsilon. \quad (3)$$

In Eqs. (2) and (3), *CAR* is the cumulative abnormal return from days −1 to +1 around the event date, which is the day of the first occasion that a high-profile regional official is prosecuted for corruption in the region (i.e., province or province-level municipality) where the firm is headquartered. (See Table 2 for details of all events used in our study.)[11] *Treat* is an indicator variable that equals 1 for treatment firms, that is, firms (whether SOEs or non-SOEs) that are headquartered in the region where the official was prosecuted for corruption and 0 otherwise. *SOE* equals 1 if the firm is a state-owned enterprise (suspect firms of collusive corruption) and 0 if the firm is a non-state-owned enterprise (suspect firms of coercive corruption). *ETC* is the actual value of entertainment and travel costs scaled by sales revenue. *PETC* is the predicted *ETC* using Eq. (1), representing the normal level of ETC. *AETC* refers to the abnormal level of *ETC*, which is the difference between actual *ETC* and *PETC*. *AETC* captures firm-specific exposure to corruption-related political risk.

In the context of Eq. (3), for firms in the treatment group (*Treat* = 1), the coefficient γ_6 on *Treat* × *AETC* captures the relation between *AETC* and *CAR* for non-SOEs (i.e., *SOE* = 0), and the coefficient γ_7 on *Treat* × *AETC* × *SOE* captures the incremental relation between the two for SOEs (i.e. *SOE* = 1); the total effect of *AETC* on CAR for SOEs is thus $\gamma_6 + \gamma_7$. Thus, hypothesis H1 predicts that, for firms in the treatment group (i.e., headquartered in provinces where local officials are prosecuted for corruption charges), the effect of *AETC* on *CAR* is *negative* for SOEs (suspected of collusive corporate corruption), because the demand for rent-sharing declines following the prosecutions, which investors consider bad news. In contrast, hypothesis H2 predicts that the same effect is *positive* for non-SOEs (suspected of coercive corporate corruption), because the demand for rent-extracting declines following the prosecutions,

[11] Abnormal returns are calculated based on market model-adjusted returns, for which we require at least 254 daily return observations during days −294 to −41 to estimate the firm-specific beta value. The market portfolio is based on all A-share category listed stocks on the Shanghai and Shenzhen stock exchanges in China.

Table 1 Variable definitions

Panel A: Explanatory variables used to estimate abnormal entertainment and travel costs	
AccPay	Accounts payable, scaled by sales revenue.
AccRcv	Accounts receivable, scaled by sales revenue.
BSize	Total number of directors on the firm's board.
ExecPay	Pay for top three managers in the firm, scaled by sales revenue.
OwnCon	Ownership percentage of the firm's 10 largest shareholders.
Size	Log of total assets.
Panel B: Main variables for hypotheses tests	
AETC	Firm-specific exposure to corruption-related political risk, estimated as abnormal *ETC*, which is calculated as the residual from the regression of Eq. (1).
CAR	Cumulative daily abnormal returns from day −1 to +1, relative to dates of events in Table 2; abnormal returns are calculated based on market model adjusted returns, for which we require at least 254 daily return observations for days −294 to −41 to estimate firm-specific beta values, and the market portfolio we apply is based on all A-share category listed stocks on China's Shanghai and Shenzhen stock exchanges.
ETC	Entertainment and travel costs, scaled by sales revenue reported in the financial statements.
GovInt	Government intervention indicator, which equals 1 for firms in provinces with above average levels of intervention as measured by the Wang et al. (2017) index and 0 otherwise.
IndComp	Industrial competition indicator, which equals 1 for firms in industries with above average levels of competition, as measured by the Herfindahl index, and 0 otherwise.
PETC	Normal *ETC* measured as a predicted value using the regression of Eq. (1).
SOE	State-owned enterprise indicator, which equals 1 for firms that are state-owned enterprises and 0 for non-state-owned enterprises.
Treat	Treatment group indicator, which equals 1 for observation for firms in a province where a regional official has been prosecuted under the anti-corruption campaign and 0 otherwise.
Panel C: Control variables used in hypotheses tests	
Age	The length of time the firm has been listed on its stock market.
Big4	Audit quality indicator, which equals 1 for firms audited by a Big Four auditor and 0 otherwise.
BIndep	Ratio of independent directors on board of directors.
BM	Book value of equity divided by market value of equity.
Growth	Annual growth rate of the firm's fixed assets.
InstOwn	Ownership percentage attributable to institutional investors.
Lev	Leverage, measured as total debt divided by total assets.
RD	Research and development expenditure divided by sales revenue.
ROA	Net income before extraordinary items divided by total assets.
SGA	Total sales and administrative expenses divided by total assets.
Subsidy	Natural logarithm of subsidies received, which equals 0 for firms without subsidies.
TQ	Tobin's Q, calculated as the firm's market value divided by the replacement cost of its net assets.
UE	Unexpected earnings, which equals the value that the firm's current earnings per share minus the firm's last year earnings per share.
Panel D: Other variables used in additional tests	
PCon	Firm-specific political connection indicator for non-SOEs, which equals 1 if the firm has a CEO or chairperson who previously worked in the government and 0 otherwise.

Table 1 (continued)

PDist	Firm-specific political connection indicator for SOEs, which equals 0 if the distance between the firm's headquarters and the regional office of the State-owned Assets Supervision and Administration Commission is within the closest quintile for the sample and 1 otherwise.
Dual	CEO duality indicator, which equals 1 if the chairman of the board is also CEO and 0 otherwise.
Inv	Value of inventories divided by sales revenue.
MAO	Modified audit opinion, which equals 1 if the audit report in the firm's financial statements for the year preceding the observation year was unqualified with explanatory notes, qualified, or disclaimed/adverse and 0 for clean audit opinions.
NPM	Net profits divided by sales revenues
PreAETC	Annual abnormal *ETC* for the year prior to the anti-corruption prosecution event

Note: This table presents the definitions of variables applied in the empirical analysis. Panel A includes the explanatory variables used to estimate abnormal entertainment and travel costs. Panel B includes the main variables used in hypothesis tests. Panel C includes the control variables used in hypotheses tests. Panel D includes other variables used in additional tests. Later panels exclude variables already defined in earlier panels

which investors consider good news. Specifically, H1 and H2 are supported if we observe $\gamma_6 + \gamma_7 < 0$ and $\gamma_6 > 0$, respectively, in Eq. (3).

We estimate the following two regressions to evaluate the conditional effects of antecedents of corporate corruption. Equation (4) provides a preliminary test based on total entertainment and travel costs and Eq. (5) implements our tests of hypotheses H3 and H4.

$$\begin{aligned} CAR = {} & \beta_0 + \beta_1 Treat + \beta_2 ETC + \beta_3 IndComp + \beta_4 Treat \times IndComp + \beta_5 GovInt \\ & + \beta_6 Treat \times GovInt + \beta_7 Treat \times ETC + \beta_8 ETC \times IndComp \\ & + \beta_9 Treat \times ETC \times IndComp + \beta_{10} ETC \times GovInt + \beta_{11} Treat \times ETC \times GovInt \\ & + Controls + Industry + Year + \varepsilon; \end{aligned} \tag{4}$$

$$\begin{aligned} CAR = {} & \gamma_0 + \gamma_1 Treat + \gamma_2 IndComp + \gamma_3 Treat \times IndComp + \gamma_4 GovInt \\ & + \gamma_5 Treat \times GovInt + \gamma_6 AETC + \gamma_7 Treat \times AETC + \gamma_8 AETC \times IndComp \\ & + \gamma_9 Treat \times AETC \times IndComp + \gamma_{10} AETC \times GovInt + \gamma_{11} Treat \times AETC \times GovInt \\ & + \gamma_{12} PETC + \gamma_{13} Treat \times PETC \times IndComp + \gamma_{14} PETC \times IndComp \\ & + \gamma_{15} Treat \times PETC \times IndComp + \gamma_{16} PETC \times GovInt + \gamma_{17} Treat \times PETC \times GovInt \\ & + Controls + Industry + Year + \varepsilon. \end{aligned} \tag{5}$$

In Eqs. (4) and (5), *IndComp* is an indicator variable for industry competition, which equals 1 for firms in industries with above-average competition, measured by the *inverse* of the Herfindahl industry concentration index, and 0 otherwise. We identify industries using two-digit CSRC (China Securities Regulatory Commission) industry

Table 2 List of event dates

Events	Officials	Regions	Announcement dates
1.	Chuncheng Li	Sichuan	Dec. 6, 2012
2.	Fake Ni	Anhui	Jun. 4, 2013
3.	Yisu Wang	Inner Mongolia	Jul. 3, 2013
4.	Daqiu Li	Guangxi	Jul. 6, 2013
5.	Jianye Ji	Jiangsu	Oct. 17, 2013
6.	Shaohua Liao	Guizhou	Oct. 28, 2013
7.	Bohuai Chen	Hubei	Nov. 19, 2013
8.	Anzhong Chen	Jiangxi	Dec. 6, 2013
9.	Xiaoguang Fu	Heilongjiang	Dec. 17, 2013
10.	Mingqian Tong	Hunan	Dec. 18, 2013
11.	Zuoli Zhu	Shaanxi	Feb. 19, 2014
12.	Daoming Jin	Shanxi	Feb. 27, 2014
13.	Peiping Shen	Yunnan	Mar. 9, 2014
14.	Xiaobing Mao	Qinghai	Apr.24, 2014
15.	Xiwei Tan	Chongqing	May 3, 2014
16.	Qingliang Wan	Guangdong	Jun. 27, 2014
17.	Wenlin Ji	Hainan	Jul. 2, 2014
18.	Changshun Wu	Tianjin	Jul. 20, 2014
19.	Tiexin Chen	Liaoning	Jul. 24, 2014
20.	Yuhai Qin	Henan	Sept. 21, 2014
21.	Bin Liang	Hebei	Nov. 20, 2014
22.	Min Wang	Shandong	Dec. 18, 2014
23.	Wucheng Lu	Gansu	Jan. 23, 2015
24.	Xinliang Si	Zhejiang	Feb. 16, 2015
25.	Zhi Li	Xinjiang	Mar. 11, 2015
26.	Gang Xu	Fujian	Mar. 20, 2015
27.	Dake Le	Tibet	Jun. 26, 2015
28.	Chunli Gu	Jilin	Aug. 1, 2015
29.	Xueshan Bai	Ningxia	Nov. 6, 2015
30.	Baojun Ai	Shanghai	Nov. 10, 2015
31.	Xiwen Lv	Beijing	Nov.11, 2015

Note: This table presents the events used in our study, that is, the first anti-corruption prosecution of a top official in each region of China. The regions include 27 provinces and four provincial-level municipalities (i.e., Beijing, Chongqing, Shanghai, and Tianjin). For each event, the name of the official, the region in with the prosecution happened, and the date of the prosecution are provided. These events and details are collected from Sina.com and People.cn

classification codes and compute the Herfindahl index as the sum of squares of the market shares of each firm. *GovInt* is a government intervention indicator that equals 1 for firms headquartered in regions with above-average government intervention and 0 otherwise. The degree of government intervention is measured by the index developed

by Wang et al. (2017). Under H3 (H4), the negative (positive) relation between *AETC* and the market reactions to the prosecutions of corrupt officials is predicted to be more pronounced among SOEs (non-SOEs) suspected of collusive (coercive) corruption in regions with greater government economic intervention, industries with stronger business competition, or both. Thus, if we observe a statistically significant negative (positive) coefficient on *Treat* × *AETC* × *GovInt* or *Treat* × *AETC* × *IndComp* in Eq. (5) for the subsample of SOEs (non-SOEs), this would support hypothesis H3 (H4). In Eqs. (2) to (5), we include control variables in accordance with relevant research (Gul et al. 2011; Zeng et al. 2016; Zeume 2017). Detailed definitions for all variables in Eqs. (1) to (5) are provided in Table 1.

3.2 Sample and data

To estimate the abnormal *ETC* using Eq. (1), we use a sample of A-share firms listed on the Shanghai and Shenzhen stock exchanges from 2009 to 2018. We manually collect the entertainment and travel costs disclosed in financial statements and exclude financial firms and observations with incomplete data from our sample. The final sample to estimate abnormal *ETC* consists of 22,873 firm-year observations. To determine the event dates for the negative demand-side shocks to corporate corruption, we identify the first date on which a leading regional official in each region in China (i.e., one of the 27 provinces or four province-level municipalities) was prosecuted for corruption following the launch of the anti-corruption campaign in 2012. Our event dates are collected from Sina.com and People.cn, which are two of the most authoritative news media sources in China and have wide readership.[12] In total, we identified 31 events that occurred from 2012 to 2015, as listed in Table 2. To analyze the share price responses to these events, we also exclude firms under special treatment (firms for which a warning of possible future delisting has been issued) and firms listed for less than five years. This yields a sample of 33,982 firm-event observations to be used for hypothesis testing. For the control variables, the data on institutional ownership are taken from the WIND database, and the data on research and development expenditure are taken from the Chinese Research Data Service Platform. All other archival data used in our study are downloaded from the China Stock Market and Accounting Research Database.[13]

4 Empirical findings

4.1 Summary statistics

Table 3 reports summary statistics for the variables used in our study. Panel A provides statistics for the variables used to estimate abnormal *ETC*, using 22,873 firm-years observations for the period 2009–2018. *ETC* equals, on average, 0.7% of annual total sales, although it reaches as high as 5.7% of annual sales revenue, indicating that this

[12] See http://news.sina.com.cn/c/nd/2015-11-11/doc-ifxkniup6319586.shtml and http://politics.people.com.cn/ywkx/n/2014/1222/c363762-26255448-2.html

[13] We winsorize all continuous variables at the 1% level in both tails to mitigate the effects of outliers.

category of expenditure is quite large for some firms. The means and medians of all variables explaining *ETC* in Eq. (1) are generally consistent with those reported by Zeng et al. (2016). Panel B presents the summary statistics for the variables used in our hypotheses tests, based on the sample of 33,982 firm-event observations for the 31 events from 2012 to 2015 and including firms in the treatment and control groups. *CAR* has a mean value of −0.001, suggesting that, on average, the market reacts negatively to news about the prosecution of corrupt regional officials. The standard deviation of *AETC* is 0.004, suggesting that this measure of abnormal entertainment and travel costs captures reasonable variations in the likelihood of corporate bribery. *Treat* has a mean value of 0.033, showing that our treatment sample accounts for 3.3% of the firm-event observations. For each of the 31 anti-corruption prosecutions, the treatment group consists of firms headquartered in the region where the event occurred, and the control group consists of all of the firms headquartered elsewhere. *SOE* has a mean value of 0.518, suggesting that SOEs (which serve as suspect firms of collusive corruption) comprise approximately half of our sample; the other half is comprised of non-SOEs (which serve as suspect firms of coercive corruption). The mean value of *IndComp* (industry competition indicator) suggests that 70.9% of firms in the full sample belong to highly competitive industries. The mean value of *GovInt* (government intervention indicator) suggests that 26.3% of firms in our sample are headquartered in regions with high levels of government economic intervention.

4.2 Estimation of firm-specific exposure to corruption-related risk

Table 4 presents our estimation of abnormal *ETC* using residual values from the regression in Eq. (1). Column 1 includes three determinants of the first component of *ETC*, that is, managerial excess spending, and Column 2 includes three determinants of the second component, that is, expenses for building and maintaining relationships. Column 3 reports the results for the full model in the presence of all explanatory variables in Eq. (1). For brevity, our discussions below are based only on the full model's results in Column 3.

The coefficient on *ExecPay* is positive and statistically significant (coef. = 1.147, *t*-stat. = 16.63). This positive impact of *ExecPay* on *ETC* is consistent with the view that actual *ETC* reported in a firm's financial statements is higher for firms with higher managerial excess spending as reflected in relatively high executive remuneration. The coefficient on *OwnCon* is negative and statistically significant (coef. = −0.001, t-stat. = −2.18). This inverse relation between *ETC* and ownership concentration comports with the view that firms with more concentrated (and thus powerful) ownership can better curb managerial excess spending and thus entertainment and travel costs. The coefficient on *BSIZE* is not statistically significant, suggesting that a large board does not necessarily lead to high or low managerial excess spending.

The coefficients on *AccPay* (coef. = 0.002, t-stat. = 2.37) and *AccRcv* (coef. = 0.005, t-stat. = 8.86) are both positive and statistically significant, suggesting that firms tend to use entertainment and travel expenditures to build relationships with suppliers and customers. The coefficient on *Size* is negative and statistically significant (coef. = −0.001, t-stat. = −7.36), suggesting that smaller firms have greater need for relationship building and thus are more likely to spend a relatively large amount on entertainment

Table 3 Summary statistics

Panel A: Variables used to estimate abnormal entertainment and travel costs						
	Obs	Mean	Median	Stdev	Q1	Q3
ETC	22,873	0.007	0.004	0.009	0.001	0.008
ExecPay	22,873	0.002	0.001	0.003	0.000	0.002
OwnCon	22,873	0.330	0.308	0.220	0.138	0.505
BSize	22,873	8.566	9.000	1.374	7.000	9.000
AccPay	22,873	0.166	0.126	0.166	0.059	0.222
AccRcv	22,873	0.243	0.177	0.239	0.067	0.336
Size	22,873	21.957	21.806	1.267	21.044	22.695
Panel B: Variables used for hypotheses tests						
	Obs	Mean	Median	Stdev	Q1	Q3
CAR	33,982	−0.001	−0.005	0.042	−0.025	0.016
ETC	33,982	0.005	0.003	0.006	0.001	0.005
PETC	33,982	0.004	0.003	0.004	0.002	0.005
AETC	33,982	0.000	−0.000	0.004	−0.002	0.002
IndComp	33,982	0.709	1.000	0.454	0.000	1.000
GovInt	33,982	0.263	0.000	0.440	0.000	1.000
Treat	33,982	0.033	0.000	0.178	0.000	0.000
SOE	33,982	0.518	1.000	0.500	0.000	1.000
UE	33,982	−0.023	0.000	0.336	−0.120	0.087
SGA	33,982	0.085	0.066	0.071	0.037	0.110
Subsidy	33,982	15.165	16.131	4.134	14.912	17.151
BM	33,982	1.016	0.665	1.022	0.371	1.231
Lev	33,982	0.492	0.494	0.208	0.331	0.655
Size	33,982	22.120	22.016	1.204	21.297	22.880
BSIZE	33,982	8.834	9.000	1.766	8.000	9.000
BIndep	33,982	0.371	0.333	0.052	0.333	0.400
ExecPay	33,982	0.001	0.001	0.003	0.000	0.001
ROA	33,982	0.030	0.026	0.052	0.008	0.054
TQ	33,982	2.991	2.129	2.694	1.476	3.380
Growth	33,982	0.157	0.020	0.547	−0.050	0.176
InstOwn	33,982	0.436	0.448	0.208	0.289	0.592
RD	33,982	0.020	0.002	0.033	0.000	0.032
Big4	33,982	0.046	0.000	0.209	0.000	0.000
Age	33,982	13.183	14.000	5.153	8.000	17.000

Note: This table presents summary statistics for the variables featured in the empirical analysis. Panel A presents statistics for variables used to estimate abnormal entertainment and travel costs over the sample period 2009–2018, and Panel B presents those for main and control variables used in the hypothesis tests based on anti-corruption prosecution events over the period 2012–2015, as listed in Table 2. All variables are defined in Table 1

and travel costs. Overall, the above findings are largely consistent with those reported by Zeng et al. (2016). They suggest that the *ETC* model in Eq. (1) successfully identifies and isolates managerial excess-spending and relationship-building

Table 4 Determinants of entertainment and travel costs

Y=ETC	[1]		[2]		[3]	
	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
ExecPay	1.302***	(20.08)			1.147***	(16.63)
OwnCon	−0.002***	(−5.93)			−0.001**	(−2.18)
BSize	−0.000	(−0.99)			0.000	(0.94)
AccPay			0.007***	(4.97)	0.002**	(2.37)
AccRcv			0.005***	(8.18)	0.005***	(8.86)
Size			−0.002***	(−18.78)	−0.001***	(−7.36)
Constant	0.005***	(6.23)	0.050***	(20.44)	0.016***	(8.53)
Year fixed effects	Yes		Yes		Yes	
Industry fixed effects	Yes		Yes		Yes	
Adjusted R^2	0.2885		0.1857		0.3090	
Observations	22,873		22,873		22,873	

Note: This table presents the analysis of entertainment and travel costs based on the regression model for Eq. (1), in which the residual provides an estimate of firm-specific exposure to corruption-related political risk based on abnormal *ETC*, calculated for the sample period 2009–2018. All variables are defined in Table 1. *** and ** denote two-tailed statistical significance at the 1% and 5% levels, respectively

components of *ETC* and thus allows the residuals of the model to reasonably capture firm-specific exposure to corruption-related political risk.

4.3 Hypotheses tests

4.3.1 Tests of hypotheses H1 and H2

Table 5 reports our baseline findings from the tests of hypotheses H1 and H2 to evaluate the relation between abnormal entertainment and travel costs and market reactions to the prosecution of corrupt regional officials for firms suspected of collusive (SOEs) and coercive (non-SOEs) corporate corruption. Column 1 provides a preliminary evaluation of the effect of total *ETC* (before the abnormal entertainment and travel costs component is separated from the other components). The coefficient on *TREAT* × *ETC* is positive and statistically significant (coef. = 0.788, *t*-stat. = 3.25), whereas the coefficient on *TREAT* × *ETC* × *SOE* is negative and statistically significant (coef. = −1.448, *t*-stat. = −3.59), which confirms that significant variation exists between SOEs and non-SOEs, even based on the analysis of total ETC. More importantly, Column 2 presents our main focus that decomposes *ETC* into *AETC* (i.e., abnormal *ETC* related to corruption-related risk exposure) and *PETC* (i.e., normal *ETC* related to managerial excess spending and expenses for relational capital building). The coefficient on *TREAT* × *AETC* is positive and statistically significant (coef. = 1.098, *t*-stat. = 2.66), whereas the coefficient on *TREAT* × *AETC* × *SOE* is negative and statistically significant (coef. = −2.044, *t*-stat. = −4.79), and the sum of these two coefficients is

negative and statistically significant (−0.946, *F*-stat. = 8.06). This indicates that the relation between *CAR* and *AETC* is significantly and incrementally negative among SOEs and significantly positive among non-SOEs in our treatment group, relative to the control group. The results are also economically meaningful if we compare the magnitude of these coefficients with that of the *Constant* (−0.021, *t*-stat. = −2.27) and the mean value of CAR reported in Table 3 (−0.001). In contrast, Column 2 shows that the coefficients on *TREAT* × *PETC* and *TREAT* × *PETC* × *SOE* are both statistically insignificant. This suggests that the baseline effect of *AETC*, which captures exposure to a firm's corruption-related political risk, is incremental beyond other components captured by *PETC*. In general, Table 5 supports the predictions in hypotheses H1 and H2.[14] To the extent that investors perceive SOEs (non-SOEs) as likely to engage in rent-sharing collusion (rent-extracting coercion), these findings imply that accounting disclosure of entertainment and travel costs facilitates investors' anticipation of losses (gains) following negative shocks to the demand side of corruption.[15]

4.3.2 Tests of hypotheses H3 and H4

Table 6 presents our findings from the test of hypothesis H3 for firms suspected of collusive corporate corruption (i.e., SOEs). Our objective here is to examine whether, for SOEs, the relation between abnormal *ETC* and market reactions to prosecution events is conditional on antecedents of corruption such as regional government intervention and industrial business competition. Column 1 reports preliminary results based on the effect of total *ETC* for SOEs. The coefficient on *Treat* × *ETC* × *GovInt* is negative and statistically significant (coef. = −1.475, *t*-stat. = −2.49), whereas the coefficient on *Treat* × *ETC* × *IndComp* is not statistically significant (coef. = 1.116, *t*-stat. = 1.61). This indicates that, among SOEs in the treatment group, high levels of government intervention but not business competition, drive more unfavorable (or more negative) market reactions to anti-corruption prosecution events. More importantly in Column 2, where *ETC* is decomposed into *AETC* and *PETC*, the coefficient on *Treat* × *AETC* × *GovInt* is negative and statistically significant (coef. = −1.392, *t*-stat. = −2.11). In contrast, the coefficients on *Treat* × *AETC* × *IndComp*, *Treat* × *PETC* × *GovInt*, and *Treat* × *PETC* × *IndComp* are either positive (i.e., opposite to the predicted

[14] In robustness tests (untabulated for brevity), we further strengthen the inference of our baseline findings in the following ways. First, we show the effects are statistically significant, even when we implement the analysis using only the treatment group, thus ensuring the results are not driven by an unidentified effect associated with the control group. Second, we show that the effects are robust to using an alternative measure of abnormal stock returns based on the market model. Third, the effects are no longer observable when we apply placebo event dates counterfactually assigned as five months before the actual event dates.

[15] We interpret the positive relation between abnormal *ETC* and market reactions to the anti-corruption prosecutions as evidence among non-SOEs that investors respond favorably to news of a reduction in the future likelihood of coercive corporate corruption through rent extraction by corrupt officials. An alternative explanation for this positive relation is that the anti-corruption prosecutions signal a leveling of the playing field for non-SOEs, relative to the SOEs. However, in additional tests (not tabulated for brevity), we observe that the positive relation among non-SOEs is statistically insignificant more pronounced among firms with SOE-based competitors in the same sector and province. Therefore, although the alternative explanation is intuitively plausible, we do not acquire supporting evidence in our research setting. We suggest that this could be considered as an avenue for future research.

Table 5 Market reactions among firms suspected of collusive (SOEs) and coercive (non-SOEs) corporate corruption (tests of hypotheses H1 and H2, respectively)

Y= CAR	[1]		[2]	
	Coef.	*t*-stat	Coef.	*t*-stat
Treat	−0.002	(−1.06)	0.000	(0.00)
SOE	−0.002**	(−2.59)	−0.001*	(−1.75)
Treat × SOE	0.000	(0.05)	−0.003	(−0.67)
ETC	−0.064	(−0.86)		
ETC×SOE	0.055	(0.85)		
Treat × ETC	0.788***	(3.25)		
Treat × ETC × SOE	−1.448***	(−3.59)		
AETC			−0.106	(−1.35)
AETC×SOE			0.119	(1.26)
Treat×AETC			1.098**	(2.66)
Treat × AETC × SOE			−2.044***	(−4.76)
PETC			0.045	(0.19)
PETC × SOE			−0.069	(−0.85)
Treat × PETC			0.356	(0.92)
Treat × PETC × SOE			−0.476	(−0.63)
UE	0.003***	(3.64)	0.003***	(3.68)
SGA	−0.013**	(−2.44)	−0.013**	(2.52)
Subsidy	0.000	(0.04)	0.000	(0.09)
BM	0.001	(1.55)	0.001	(1.52)
Lev	0.001	(0.70)	0.001	(0.76)
Size	0.001**	(2.39)	0.001**	(2.12)
BSize	0.000	(0.01)	−0.000	(−0.02)
BIndep	−0.007	(−1.23)	−0.007	(−1.26)
ExecPay	−0.058	(−0.38)	−0.134	(−0.41)
ROA	−0.024***	(−3.21)	−0.023***	(−3.12)
TQ	0.001***	(7.04)	0.001***	(6.93)
Growth	0.000	(0.48)	0.000	(0.48)
InstOwn	0.002	(1.56)	0.002	(1.63)
RD	−0.000	(−0.05)	−0.001	(−0.07)
Big4	−0.001	(−1.20)	−0.001	(−1.20)
Age	0.000	(0.03)	0.000	(0.11)
Constant	−0.020**	(−2.56)	−0.021**	(−2.27)
Year and industry fixed effects	Yes		Yes	
Adjusted R^2	0.0090		0.0089	
Observations	33,982		33,982	

Note: This table presents the results of tests of hypotheses H1 and H2, analyzing of market reactions to anti-corruption prosecutions for the period 2012–2015, as listed in Table 2. The sample includes both SOEs (*SOE* = 1) and non-SOEs (*SOE* = 0) as firms suspected of collusive and coercive corporate corruption, respectively, and firms in both the treatment and control groups All variables are defined in Table 1. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively

sign) and statistically significant or insignificant. These results not only support the general prediction in H3 but also reveal that government intervention dominates over business competition in influencing our baseline findings among SOEs. Thus the evidence suggests that investors perceive that rent-sharing collusion yields greater advantages for SOEs when corrupt officials have more power (*GovInt* = 1) but does not when firms face greater competitive pressure (*IndComp* = 1).

Table 7 reports the results of our test of hypothesis H4 for firms suspected of coercive corporate corruption (i.e., non-SOEs). Our objective here is to evaluate, for these firms, whether antecedents of corruption, such as regional government intervention and industrial business competition, can influence the relation between abnormal *ETC* and share price responses to prosecution events. As shown in the preliminary results based on total *ETC* presented in Column 1, the coefficient on *Treat* × *ETC* × *IndComp* is positive and statistically significant (coef. = 1.141, *t*-stat. = 1.92), whereas the coefficient on *Treat* × *ETC* × *GovInt* is statistically insignificant at conventional levels. The finding indicates that, among non-SOEs in the treatment group, it is business competition (*IndComp*) and not government intervention (*GovInt*), that drives more favorable market reactions to anti-corruption prosecutions. More importantly in Column 2, we decompose *ETC* into its *AETC* and *PETC* components and find that the coefficient on *Treat* × *AETC* × *IndComp* is positive and statistically significant (coef. = 1.610, *t*-stat. = 2.37) and the coefficients on *Treat* × *AETC* × *GovInt*, *Treat* × *PETC* × *IndComp*, and *Treat* × *PETC* × *GovInt* are insignificant at the conventional levels. Not only are these findings consistent with the general prediction of H4, but they also indicate that business competition outweighs government economic intervention in driving more favorable market reactions to anti-corruption prosecutions among firms suspected of coercive corporate corruption (i.e., non-SOEs). Therefore, our findings reveal that investors perceive that rent-extracting coercion generates greater disadvantages when non-SOEs face higher competitive pressure but does not when the expropriation is carried out by more powerful officials.

4.4 Additional tests

4.4.1 Changes in operating performance

Our analysis thus far focuses on differences in the impact of abnormal *ETC* on the stock price responses to anti-corruption prosecutions between firms suspected of collusive corruption (SOEs) and those suspected of coercive corruption (non-SOEs). We now further test whether abnormal *ETC* affects changes in operating performance from before to after the anti-corruption prosecutions and how this influence differs for the two subsamples. Our objective is to verify whether differences in the observed relations between abnormal *ETC* and the market reaction to the prosecutions (i.e., the negative relation for SOEs and the positive relation for non-SOEs) align with differences in the economic consequences (as reflected in subsequent operating performance) between SOEs and non-SOEs.

Collusive (coercive) corporate corruption reduces (increases) the costs for firms as a result of rent sharing (extraction). We use the net profit margin (*NPM*) as our measure

Table 6 Market reactions among firms suspected of collusive corporate corruption (SOEs), conditional on antecedents of corruption (test of hypothesis H3)

Y= CAR	[1]		[2]	
	Coef.	*t*-stat	Coef.	*t*-stat
Treat	0.000	(0.05)	−0.001	(−0.21)
ETC	−0.120	(−0.78)		
IndComp	−0.001	(−1.26)	−0.001	(−1.27)
Treat × IndComp	−0.006	(−1.49)	−0.005	(−1.14)
GovInt	0.001	(0.83)	0.000	(0.38)
Treat × GovInt	0.006	(1.09)	0.006	(0.84)
Treat × ETC	−0.932	(−1.19)		
ETC × IndComp	0.120	(0.81)		
Treat × ETC × IndComp	1.116	(1.61)		
ETC × GovInt	0.087	(0.93)		
Treat × ETC × GovInt	−1.475**	(−2.49)		
AETC			−0.051	(−0.29)
Treat × AETC			−1.572**	(−2.74)
AETC × IndComp			0.069	(0.42)
Treat × AETC × IndComp			1.437**	(2.09)
AETC × GovInt			0.029	(0.22)
Treat × AETC × GovInt			−1.392**	(−2.11)
PETC			−0.330	(−1.02)
Treat × PETC			−0.130	(−0.10)
PETC × IndComp			0.121	(0.67)
Treat × PETC × IndComp			0.798	(0.73)
PETC × GovInt			0.215	(1.12)
Treat × PETC × GovInt			−1.609	(−1.37)
UE	0.004***	(3.21)	0.004***	(3.25)
SGA	−0.001	(−0.17)	−0.001	(−0.21)
Subsidy	−0.000**	(−2.56)	−0.000**	(−2.56)
BM	0.001	(1.20)	0.001	(1.19)
Lev	−0.001	(−0.31)	−0.001	(−0.24)
Size	0.001	(1.31)	0.001	(0.98)
BSize	0.000	(1.10)	0.000	(1.12)
BIndep	0.003	(0.43)	0.003	(0.40)
ExecPay	−0.167	(−0.85)	0.016	(0.05)
ROA	−0.030***	(−3.15)	−0.030***	(−3.08)
TQ	0.001**	(2.20)	0.001**	(2.15)
Growth	−0.000	(−0.34)	−0.000	(−0.34)
InstOwn	0.002	(0.98)	0.002	(0.90)
RD	−0.013	(−0.69)	−0.011	(−0.62)
Big4	−0.001	(−0.38)	−0.001	(−0.44)
Age	0.000	(0.58)	0.000	(0.57)

Table 6 (continued)

Y = *CAR*	[1]		[2]	
	Coef.	*t*-stat	Coef.	*t*-stat
Constant	−0.020*	(−1.85)	−0.017	(−1.28)
Year and industry fixed effects	Yes		Yes	
Adjusted R^2	0.0161		0.0159	
Observations	17,590		17,590	

Note: This table presents the results of tests of hypothesis H3, analyzing market reactions to anti-corruption prosecutions over the period 2012–2015, as listed in Table 2, conditional on levels of regional government intervention (*GovInt*) and industrial business competition (*IndComp*), as antecedents of corruption. The sample includes SOEs as firms suspected of collusive corporate corruption and firms in both the treatment and control groups. All variables are defined in Table 1. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively

of operating performance because it captures the effect of corruption on business costs; *NPM* is defined as the ratio of net profits to sales revenues and thus relates inversely to business costs. For our difference-in-differences analysis, we use the indicator variable *Post* to differentiate between years before and after the first prosecution of corrupt government officials in the region where the firm is headquartered; *Post* takes the value of 1 for years after the first prosecution and 0 otherwise. We define *PreAETC* as the annual abnormal *ETC* for the year *before* the anti-corruption prosecution.

Panels A and B of Table 8 report the results for SOEs and non-SOEs, respectively. In Panel A, we presume that investors are likely to perceive corruption practices by SOEs as rent-sharing with corrupt officials in a way that would offer costs reductions. As shown in Panel A, the coefficient on *PreAETC* × *Post* (coef. = −2.493, *t*-stat. = −4.05) in Column 1 and the coefficient on *PreAETC* × *Post* × *GovInt* (coef. = −7.756, *t*-stat. = −6.05) in Column 2 are both *negative* and highly significant, and the latter coefficient is more significant, about three times greater in its absolute magnitude, compared to the former coefficient. This suggests that, among SOEs, the firms with high abnormal *ETC* experience a decrease in net profit margins following anti-corruption prosecutions and this effect is concentrated far more among firms headquartered in regions with greater government intervention (*GovInt* = 1). Because our control variables include firm profitability captured by *ROA*, the significant reduction in the net profit margin we observe is likely associated with increased business costs (rather than decreased profitability) following the anti-corruption prosecutions. This comports with the view that the increase in business costs stems from reduced opportunities to collude to share rents after the prosecutions.

In Panel B, we presume that investors are likely to perceive corruption pursued by non-SOEs as cost-increasing rent extraction by corrupt officials. As shown in Panel B, the coefficient on *PreAETC* × *Post* (coef. = 1.138, *t*-stat. = 1.84) in Column 1 and the coefficient on *PreAETC* × *Post* × *IndComp* (coef. = 3.605, *t*-stat. = 2.55) in Column 2

Table 7 Market reactions among firms suspected of coercive corporate corruption (non-SOEs), conditional on antecedents of corruption (test of hypothesis H4)

Y= CAR	[1]		[2]	
	Coef.	*t*-stat	Coef.	*t*-stat
Treat	−0.003	(−0.61)	−0.004	(−0.55)
ETC	0.084	(0.76)		
IndComp	0.002*	(1.87)	0.001	(0.71)
Treat × IndComp	−0.002	(−0.27)	0.002	(0.19)
GovInt	0.000	(0.24)	0.001	(0.86)
Treat × GovInt	0.011**	(2.51)	0.011**	(2.28)
Treat × ETC	0.047	(0.09)		
ETC × IndComp	−0.158	(−1.47)		
Treat × ETC × IndComp	1.141*	(1.92)		
ETC × GovInt	−0.107	(−1.00)		
Treat × ETC × GovInt	−0.729	(−1.44)		
AETC			0.171	(0.93)
Treat × AETC			−0.168	(−0.27)
AETC × IndComp			−0.366*	(−2.02)
Treat × AETC × IndComp			1.610**	(2.37)
AETC × GovInt			0.094	(0.57)
Treat × AETC × GovInt			−0.328	(−0.36)
PETC			0.065	(0.15)
Treat × PETC			0.358	(0.32)
PETC × IndComp			0.131	(0.71)
Treat × PETC × IndComp			0.384	(0.31)
PETC × GovInt			−0.275*	(−1.85)
Treat × PETC × GovInt			−0.913	(−1.10)
UE	0.003**	(2.69)	0.003**	(2.61)
SGA	−0.021***	(−4.12)	−0.020***	(−4.23)
Subsidy	0.000	(1.35)	0.000	(1.51)
BM	0.000	(0.58)	0.000	(0.44)
Lev	0.003	(1.00)	0.003	(1.05)
Size	0.001	(1.37)	0.001	(1.43)
BSize	−0.000	(−1.48)	−0.001	(−1.49)
BIndep	−0.019**	(−2.28)	−0.018**	(−2.16)
ExecPay	0.146	(0.75)	−0.039	(−0.08)
ROA	−0.015	(−1.61)	−0.015	(−1.56)
TQ	0.001***	(6.20)	0.001***	(6.21)
Growth	0.000	(0.45)	0.000	(0.43)
InstOwn	0.002	(1.56)	0.002	(1.56)
RD	0.008	(0.65)	0.010	(0.74)
Big4	−0.001	(−0.34)	−0.001	(−0.27)
Age	0.000	(0.65)	0.000	(0.61)

Table 7 (continued)

Y = *CAR*	[1]		[2]	
	Coef.	*t*-stat	Coef.	*t*-stat
Constant	−0.015	(−1.08)	−0.020	(−1.15)
Year and industry fixed effects	Yes		Yes	
Adjusted R^2	0.0074		0.0073	
Observations	16,392		16,392	

Note: This table presents the results of tests of hypothesis H4, analyzing market reactions to anti-corruption prosecution events over the period 2012–2015, as listed in Table 2, conditional on levels of regional government intervention (*GovInt*) and industrial business competition (*IndComp*), as antecedents of corruption. The sample includes non-SOEs as firms suspected of coercive corporate corruption and firms in both the treatment and control groups. All variables are defined in Table 1. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively

are both *positive* and statistically significant. This suggests that non-SOEs with high abnormal *ETC* experience an increase in net profit margins following anti-corruption prosecutions and this increase is concentrated among firms that operate in more competitive industries (*IndComp* = 1). Note that, in both Columns 1 and 2, we include *ROA* to control for the effect of firm profitability on *NPM*. To the extent that the inclusion of *ROA* adequately controls for potential variations in firm profitability, the significant post-period increase in *NPM* for non-SOEs can be attributed largely to the reduced costs associated with the prosecution of rent-extracting officials.

Overall, the results presented in Table 8 show that the ex post changes in firms' operating performance correspond with the association between the exposure to corruption-related political risk on the supply side of corporate corruption (as captured by the pre-period abnormal *ETC*) and the market reactions to the negative demand-side shocks to corporate corruption (as caused by the prosecutions of corrupt officials). The results suggest that the information content of entertainment and travel costs disclosed in financial statements can help investors to anticipate the economic consequences of changes in corruption-related political risks.

4.4.2 Influence of firm-specific political connections

In Table 9, we further examine whether firm-specific political connections do matter and, if so, how their effects differ between SOEs and non-SOEs. Our maintained assumption of SOEs (non-SOEs) as suspect of collusive (coercive) corporate corruption stems from the stronger (weaker) government ties and support associated with such firms. If firms' ties with the government indeed increase (decreases) the likelihood of rent-sharing with (rent-extraction by) corrupt officials for SOEs (non-SOEs), then we would expect firm-specific political connections among SOEs (non-SOEs) to further increase (decrease) their tendency to engage in collusive (coercive) corruption. Beyond the stronger (weaker) *innate* government ties associated with SOEs (non-SOEs), firm-specific political connections might also influence investors' tendency to perceive

Table 8 Difference-in-differences analyses of net profit margins (additional tests)

Panel A: Firms suspected of collusive corporate corruption (SOEs)				
Y= NPM	[1]		[2]	
	Coef.	*t*-stat	Coef.	*t*-stat
PreAETC	0.406	(0.90)	−0.181	(−0.34)
Post	0.004	(0.56)	0.009	(1.17)
PreAETC × *Post*	−2.493***	(−4.05)	0.488	(0.65)
GovInt			−0.003	(−0.45)
PreAETC × *GovInt*			1.968**	(2.00)
POST × *GovInt*			−0.009	(−1.26)
PreAETC × *Post* × *GovInt*			−7.756***	(−6.05)
ROA	2.138***	(77.75)	2.132***	(77.73)
Size	−0.003**	(−2.16)	−0.004***	(−2.77)
Dual	−0.000	(−0.05)	−0.000	(−0.02)
BSize	−0.001	(−0.96)	−0.001	(−0.71)
BIndep	0.044	(1.40)	0.053*	(1.68)
ExecPay	−1.977***	(−3.60)	−1.761***	(−2.73)
Inv	0.004	(1.27)	0.002	(0.76)
AccRcv	−0.037***	(−3.93)	−0.035***	(−3.70)
MAO	−0.033***	(−3.69)	−0.032***	(−3.67)
Constant	0.015	(0.40)	0.032	(0.88)
Year and industry fixed effects	Yes		Yes	
Adjusted R^2	0.5307		0.5345	
Observations	6580		6580	
Panel B: Firms suspected of coercive corporate corruption (non-SOEs)				
Y= NPM	[1]		[2]	
	Coefficient	*t*-stat	Coefficient	*t*-stat
PreAETC	−1.527***	(−2.75)	−0.323	(−0.30)
Post	−0.001	(−0.10)	−0.002	(−0.16)
PreAETC × *Post*	1.138*	(1.84)	−1.537	(−1.26)
IndComp			−0.002	(−0.17)
PreAETC × *IndComp*			−1.624	(−1.29)
POST × *IndComp*			0.002	(0.14)
PreAETC × *Post* × *IndComp*			3.605**	(2.55)
ROA	2.607***	(88.15)	2.606***	(88.02)
Size	−0.008***	(−3.34)	−0.008***	(−3.40)
Dual	−0.001	(−0.26)	−0.001	(−0.22)
BSize	−0.004**	(−2.17)	−0.004**	(−2.11)
BIndep	−0.066	(−1.38)	−0.062	(−1.28)
ExecPay	−3.987***	(−6.70)	−4.101***	(−6.86)
Inv	−0.001	(−0.36)	−0.001	(−0.37)
AccRcv	−0.021**	(−2.13)	−0.021**	(−2.11)
MAO	−0.071***	(−6.91)	−0.070***	(−6.80)
Constant	0.155***	(2.62)	0.156***	(2.61)

Table 8 (continued)

Year and industry fixed effects	Yes	Yes
Adjusted R^2	0.5521	0.5525
Observations	7887	7887

Note: This table presents the results of additional tests based on difference-in-differences analysis of net profit margins (*NPM*) over the sample period 2009 to 2018. Panel A (B) is based on SOEs (non-SOEs) as firms suspected of collusive (coercive) corporate corruption and evaluates the conditioning effect of regional government intervention, *GovInt* (industrial business competition, *IndComp*). *Post* equals 1 for years after the first prosecution of corrupt officials in the province and 0 otherwise. All variables are defined in Table 1. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively

corporate corruption of such firms as collusive (coercive) in nature. To this extent, we would expect to observe empirical evidence consistent with our baseline findings. Specifically, for SOEs (non-SOEs), we conjecture a negative (positive) relation between abnormal entertainment and travel costs and market reactions to anti-corruption prosecutions to be more (less) pronounced among those with stronger firm-specific political connections.

As shown in Table 9, we indeed acquire evidence in support of the above conjecture. Because SOEs have innate government affiliations, we measure cross-sectional variation in their firm-specific political connections as the distance (*PDist*) between their headquarters and the regional office of the state shareholder institution, that is, the State-owned Asset Supervision and Administrative Commission (SASAC), which controls SOEs. Studies confirm that proximity to political power increases firms' political connection (Faccio and Parsley 2009; Kim et al. 2012). We define *PDist* as 0 for SOEs among the quintile with closest distance in our sample and 1 otherwise; therefore SOEs with lower *PDist* values have stronger political connections. Because non-SOEs do not have innate government ties, we measure firm political connections based on whether the firm's CEO or chairperson has experience of working in the government (*PCon*). Studies provide evidence that CEOs and chairpersons who formerly served in the government contribute to firms' political connections (Fan et al. 2007; Wu et al. 2012). We define *PCon* as 1 for non-SOEs with such a CEO or chairperson and 0 otherwise; therefore non-SOEs with higher *PCon* value have stronger political connections.

Panel A of Table 9 shows that, among the SOEs, the coefficient on *AETC* × *Treat* is negative and statistically significant (coef. = −2.139, *t*-stat. = −3.41) and the coefficient on *AETC* × *PDist* × *Treat* is positive and statistically significant (coef. = 1.749, *t*-stat. = 2.68). Whereas our baseline findings for SOEs of a negative relation between abnormal *ETC* and market reactions to anti-corruption prosecutions remains highly significant for those with headquarters closer to the regional office of SASAC (for those with *PDist* = 0), this effect is significantly moderated for those that are farther away (for those with *PDist* = 1). Thus our evidence is consistent with the view that collusive corporate corruption among SOEs is significantly more pronounced for those with relatively stronger political connections (*PDist* = 0). Although Panel A reveals that political connections (captured by *PDist*) do matter in shaping the relation between demand-side shocks to collusive corruption and negative market reactions, it does not necessarily

Table 9 Influence of firms-specific political connections among firms suspected of collusive (SOEs) and coercive (non-SOEs) corporate corruption (additional test)

Panel A: Firms suspected of collusive corruption (SOEs)			Panel B: Firms suspected of coercive corruption (non-SOEs)		
Y= CAR	Coef.	*t*-stat	*Y= CAR*	Coef.	*t*-stat
AETC	−0.024	(−0.11)	*AETC*	−0.068	(−0.49)
PDist	0.001	(1.42)	*PCon*	0.001	(1.10)
AETC × *PDist*	0.020	(0.08)	*AETC* × *PCon*	−0.159	(−0.74)
Treat	−0.003	(−0.55)	*Treat*	0.002	(1.15)
AETC × *Treat*	−2.139***	(−3.41)	*AETC* × *Treat*	1.870***	(3.24)
PDist × *Treat*	−0.002	(−0.36)	*PCon* × *Treat*	0.000	(0.02)
AETC × *PDist* × *Treat*	1.749**	(2.68)	*AETC* × *PCon* × *Treat*	−2.104**	(−2.34)
Constant	−0.023**	(−2.09)	*Constant*	−0.016	(−1.10)
Controls	Yes		Controls	Yes	
Year and industry fixed effects	Yes		Year and industry fixed effects	Yes	
Adjusted R^2	0.0160		Adjusted R^2	0.0068	
Observations	17,590		Observations	16,392	

Note: This table presents the results of additional tests of market reactions to anti-corruption prosecutions for the period 2012–2015, as listed in Table 2, conditional on cross-sectional variations in firm-specific degree of political connection. Panel A is based on firms suspected of collusive corruption (SOEs), and Panel B is based on firms suspected of coercive corruption (non-SOEs). For SOEs, political connection is measured by a firm-specific political connection indicator, which equals 0 if the distance between the firm's headquarters and the regional office of the State-owned Assets Supervision and Administration Commission is within the closest quintile for the sample and 1 otherwise (*PDist*). For non-SOEs, political connection is measured by a firm-specific political connection indicator, which equals 1 if the firm has a CEO or chairperson who worked in the government and 0 otherwise (*PCon*). The sample includes firms in both the treatment and control groups. All variables are defined in Table 1. *** and ** denote two-tailed statistical significance at the 1% and 5% levels, respectively

show that SOEs with relatively weaker firm-specific political connection (i.e., *PDist* = 1) would instead be associated with coercive corruption effects (or positive market reactions) because the sum of the two coefficients is not statistically significant (−0.390, *F*-stat. = 1.34). The dominance of the collusive corruption effect among SOEs suggests that the government ties of these firms may reduce the likelihood of rent-extracting coercion by corrupt officials.

Panel B shows that, among non-SOEs, the coefficient on *AETC* × *Treat* is positive and statistically significant (coef. = 1.870, *t*-stat = 3.24) and the coefficient on *AETC* × *PCon* × *Treat* is negative and statistically significant (coef. = −2.104, *t*-stat = −2.34). This indicates that, for these firms, our baseline finding of a positive relation between abnormal *ETC* and share price responses to anti-corruption prosecutions holds for those without a CEO or chairperson who worked in the government (*PCon* = 0) but that this effect is significantly reduced for those with a CEO or chairperson with a former government affiliation (*PCon* = 1). Stated differently, coercive corruption among non-SOEs is significantly stronger for those with weaker firm political connections (*PCon*

= 0). Although Panel B reconfirms the coercive corruption effect (based on *positive* share price responses to the prosecutions) among non-SOEs, it does not necessarily provide evidence that the ones with weaker political connections (*PCon* = 0) would instead be associated with collusive corruption (or *negative* market reactions). This is because the sum of the coefficients on *AETC* × *Treat* and *AETC* × *PCon* × *Treat* is statistically insignificant (−0.234, *F*-stat. = 0.09).[16]

4.4.3 Cross-sectional variations in the level of abnormal ETC

In Table 10, we further examine whether and, if so, how our baseline results differ systematically between firms (SOEs and non-SOEs) with positive versus negative abnormal ETC. Our analysis thus far considers abnormal *ETC* as a relative measure that captures firms' exposure to corruption-related political risk. We maintain that a firm with higher abnormal entertainment and travel costs will tend to have a greater level of corruption-related spending beyond the normal (expected) entertainment and travel costs associated with managerial excess spending and expenses for building and maintaining the relationship with customers and suppliers. Under this maintained assumption, a greater positive (negative) value of abnormal *ETC* would indicate that firms overspend (underspend) entertainment and travel costs on corruption. However, when investors seek evidence of bribery, which is not easily observable, they might primarily focus more on and react more intensely to variations in abnormal *ETC* when it is positive (*AETC* > 0) than they do when it is negative (*AETC* < 0). This is because actual supply of bribery by firms is better captured by positive abnormal *ETC* than by negative abnormal ETC. To this extent, we expect our baseline findings to be more pronounced for firms with *AETC* > 0 than for those with *AETC* < 0.

Table 10 provides evidence supporting the above conjecture. Panel A presents the findings for SOEs (suspected of collusive corruption). We observe that, only when *AETC* is positive, is the coefficient on *AETC* × *Treat* negative and statistically significant (coef. = −1.151, *t*-stat = −1.84). Thus, consistent with our baseline findings, this coefficient is statistically insignificant (coef. = −0.742, *t*-stat = −0.53) when *AETC*

[16] Our research design generally assumes that SOEs (non-SOEs) are suspected of collusive (coercive) corporate corruption due to their innate ties to the Chinese government, and the main inferences based on our hypothesis tests are consistent with this conjecture. Despite this, some SOEs (non-SOEs) with relatively weaker (stronger) firm-specific political connections might also engage in the alternative form of corruption under coercion by (in collusion with) corrupt officials. However, there are reasons why the alternative form of corruption may not be highly observable, even in our additional test identifying variations in firm political connections, reported in Table 9. First, among SOEs, investors might not necessarily perceive coercive corruption to be a disadvantage because government ties may ensure that any incremental business costs incurred due to coercion could be indirectly compensated by other forms of financial support, such as state subsidies. As such, even among SOEs with weaker political connections that experience coercion, share price responses to anti-corruption prosecutions may not necessarily be as favorable as among non-SOEs. Second, among non-SOEs, investors might perceive that opportunities for collusive corruption only generate transitory benefits, because political connections established through executives' personal links may diminish when they leave the firm or when their contacts in government change jobs or become disfavored. Thus, even among non-SOEs with stronger political connections that may collude, share price responses to prosecutions of corrupt officials may not be as unfavorable as among SOEs. Therefore, although the alternative form of corruption is plausible, we do not acquire strong supporting evidence in our research setting, and, to strengthen the findings of our study, we suggest that this be considered as an avenue for future research.

Table 10 Cross-sectional variations in positive vs. negative abnormal entertainment and travel costs (additional test)

Panel A: Firms Suspected of collusive corruption (SOEs)				
	AETC>0		*AETC*<0	
Y= CAR	Coef.	*t*-stat	Coef.	*t*-stat
AETC	−0.045	(−0.28)	−0.197	(−0.53)
Treat	−0.002	(−0.77)	−0.004	(−1.14)
AETC × *Treat*	−1.151*	(−1.84)	−0.742	(−0.53)
Constant	−0.025*	(−1.80)	−0.006	(−0.40)
Controls	Yes		Yes	
Year and industry fixed effects	Yes		Yes	
Adjusted R^2	0.0199		0.0117	
Observations	8734		8856	
Panel B: Firms Suspected of coercive corruption (non-SOEs)				
	AETC>0		*AETC*<0	
Y= CAR	Coefficient	*t*-stat	Coefficient	*t*-stat
AETC	−0.046	(−0.36)	−0.801**	−2.56
Treat	0.003	(0.81)	0.000	(0.04)
AETC × *Treat*	1.119**	(2.33)	0.825	(0.68)
Constant	0.007	(0.44)	−0.057***	(−3.02)
Controls	Yes		Yes	
Year and industry fixed effects	Yes		Yes	
Adjusted R^2	0.0118		0.0074	
Observations	7924		8468	

Note: This table presents the results of additional tests of market reactions to anti-corruption prosecutions for the period 2012–2015, as listed in Table 2, separately analyzing groups of observations with positive and negative abnormal entertainment and travel costs (*AETC*). All variables are defined in Table 1. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively

is negative. Panel B reports the results for non-SOEs (suspected of coercive corruption). We show that only when *AETC* is positive is the coefficient on *AETC* × *Treat* positive and statistically significant (coef. = 1.119, *t*-stat = 2.33). Thus, consistent with our baseline findings, this coefficient is statistically insignificant (coef. = 0.825, *t*-stat = 0.68) when *AETC* is negative. In both Panels A and B, the adjusted R^2 is also higher for positive *AETC* than negative *AETC*. This suggests that positive abnormal entertainment and travel costs have stronger explanatory power than negative abnormal entertainment and travel costs for the share price responses to anti-corruption prosecutions. The above findings, taken together, suggest that investors pay more (less) attention to the corruption consequences when firms are seen as overspending (underspending) on entertainment and travel costs as part of corporate corruption.

4.4.4 Changes in abnormal ETC

In Table 11, we examine how the average level of abnormal ETC and its volatility change from before to after the anti-corruption prosecutions of regional officials for our

sample period of 2009–2018. We conjecture that the prosecutions of corrupt government officials lead to a reduction of bribery by firms. Panels A and B report the average level of *ETC* and *AETC*, respectively, while Panels C and D present the average volatility (i.e., firm-specific three-year standard deviations) of *ETC* and *AETC*, respectively. For *ETC*, we observe significant decline in the average level (Panel A) and its volatility (Panel C) after anti-corruption prosecutions. This decline holds not only across the full sample in general but also when the full sample is partitioned into suspect firms of collusive (SOEs) versus coercive corruption (non-SOEs). For *AETC*, we acquire evidence of significant decline in the average level (Panel B) and its volatility (Panel D) after the anti-corruption prosecutions not only for the full sample in general but also for the two subsamples. Overall, the findings in Table 11 suggest that the string of anti-corruption prosecutions across China generated significantly affected corruption-related spending and lend further support to our maintained assumption that these prosecutions could be viewed as negative demand-side shocks to corporate corruption.[17]

Furthermore, we observe that the average level and volatility of both *ETC* and *AETC* are overall significantly higher for non-SOEs than for SOEs both before and after the anti-corruption prosecutions. These findings suggest that non-SOEs spend more on corruption than SOEs; the former firms face greater economic pressure to bribe than the latter firms because they are associated with weaker government ties and support. The difference between the two types of firms persists even after the negative shock from the demand-side of corruption. Although the demand-side shocks associated with anti-corruption prosecutions may reduce the supply of corruption-related spending, such shocks are not expected to change the inherent disadvantages of non-SOEs due to their lack of government ties, compared to SOEs.

5 Conclusion

This study evaluates the effects of collusive and coercive corporate corruption on firm value, based on prosecutions of corrupt officials as exogenous and negative demand-side shocks to corporate corruption, with exposure to corruption-related risk estimated from corruption-related spending disclosed by firms on the supply-side of corruption. Among SOEs (non-SOEs), which are assumed to be more likely to be perceived by investors as engaging in collusive (coercive) corruption, we find a negative (positive) relation between firm-specific exposure to corruption-related political risk and share price responses to news about prosecution of corrupt government officials in the regions where firms are headquartered. We further find that this effect is more pronounced for SOEs when these firms are based in the regions with greater government intervention and for non-SOEs when they are based in the regions with higher

[17] We report findings based on analysis with balanced firm-year observations both before and after the prosecutions to maximize comparability. According to our results (untabulated for brevity), the post-prosecution period reductions in average level and volatility of *AETC* are also observed when the analysis is carried on unbalanced firm-year observations or only among firms in the treatment group.

Table 11 Changes in the level and volatility of abnormal entertainment and travel costs (additional test)

Panel A: *ETC* level					
	Before		After		
	Obs.	Mean	Obs.	Mean	After – Before
All firms	1725	0.00485	1725	0.00399	−0.00086***
Firms suspected of collusive corruption (SOEs)	1050	0.00430	1050	0.00326	−0.00104***
Firms suspected of coercive corruption (non-SOEs)	675	0.00570	675	0.00512	−0.00058*
SOEs – non-SOEs		−0.00140***		−0.00186***	
Panel B: *AETC* level					
	Before		After		
Sample	Obs.	Mean	Obs.	Mean	After – Before
All firms	1725	0.00060	1725	−0.00045	−0.00105***
Firms suspected of collusive corruption (SOEs)	1050	0.00043	1050	−0.00097	−0.00140***
Firms suspected of coercive corruption (non-SOEs)	675	0.00087	675	0.00036	−0.00051*
SOEs – non-SOEs		−0.00044**		−0.00133***	
Panel C: *ETC* volatility					
	Before		After		
Sample	Obs.	Mean	Obs.	Mean	After – Before
All firms	1725	0.00253	1725	0.00203	−0.00050***
Firms suspected of collusive corruption (SOEs)	1050	0.00215	1050	0.00161	−0.00054***
Firms suspected of coercive corruption (non-SOEs)	675	0.00310	675	0.00269	−0.00041**
SOEs – non-SOEs		−0.00095***		−0.00108***	
Panel D: *AETC* volatility					
	Before		After		
Sample	Obs.	Mean	Obs.	Mean	After – Before
All firms	1725	0.00253	1725	0.00221	−0.00032***
Firms suspected of collusive corruption (SOEs)	1050	0.00221	1050	0.00199	−0.00022**
Firms suspected of coercive corruption (non-SOEs)	675	0.00302	675	0.00255	−0.00047***
SOEs – non-SOEs		−0.00081***		−0.00056***	

Note: This table presents the results of additional tests of the level (Panels A and B) and volatility (Panels C and D) of the entertainment and travel costs (*ETC*) and abnormal entertainment and travel costs (*AETC*) measures before and after the first prosecutions of corrupt officials in the province, for samples based on all firms, firms suspected of collusive corruption (SOEs), and firms suspected of coercive corruption (non-SOEs), over the sample period 2009–2018. In Panels C and D, the firm-specific volatility of *ETC* and *AETC* are calculated as the standard deviations of these measures over a minimum of three years either before or after the prosecutions. All variables are defined in Table 1. ***, **, and * denote two-tailed statistical significance at the 1%, 5%, and 10% levels, respectively

business competition. These findings are consistent with the view that outside investors consider the anti-corruption prosecution of regional officials as bad (good) news, in terms of its implications on firm value, when the firms are expected to benefit (suffer) from collusive (coercive) corruption. Furthermore, among SOEs (non-SOEs), which are assumed to be suspect of collusive (coercive) corruption, we observe a significant fall (rise) in net profit margin in the period after the prosecution of corrupt regional officials. Because rent-sharing collusion (rent-extracting coercion) reduces (increases) business costs, this is consistent with the deterioration (improvement) of cost management efficiency among firms suspected of collusive (coercive) corruption following the anti-corruption prosecutions.

Although our research is conducted in China's institutional setting, our findings offer useful policy implications for other jurisdictions. On the demand side of corporate corruption, we provide evidence that exogenous shocks to corruption-related political risk can influence firm value in opposite directions, depending on whether the corruption is perceived by investors as collusive or coercive. Specifically, we show that negative demand-side shocks to corporate corruption entail the valuation discount (premium) for firms that engage in collusive (coercive) corruption. Given the importance of this issue, further research is warranted on the causes and consequences of firms' exposure to corruption-related political risks.[18] On the supply side of corporate corruption, we show that corruption-related expenses derived from firms' financial statements can inform investors of firms' exposure to political risk. This suggests that the disclosure of expenditures that can indicate corruption, such as entertainment and travel costs, could facilitate the detection of bribery and could therefore contribute to investor protection and corruption deterrence. In light of the scarcity of empirical evidence on this important issue, we recommend further research on the determinants and consequences of disclosure of corruption-related information in accounting reports.

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[18] Although our study draws on anti-corruption prosecution events as exogenous demand-side shocks to corporate corruption, our evidence focuses primarily on the supply-side impact, based on the firm perspective. One limitation of our study is that it cannot provide evidence from the perspective of government officials, particularly in terms of their preference and concerns regarding the two forms of corporate corruption. This is due to our lack of access to empirically observable data from the side of government officials that could capture their opinions and behavior. Another limitation of our study is that we do not provide in depth analysis of the specific anti-corruption allegations associated with our prosecution events, especially in terms of their relevance to the two forms of corporate corruption and their impact on the corruption demand. This is because detailed information from specific investigations is not publicly available, largely to protect personal privacy and corporate reputations. We encourage future research to address these interesting and important issues in the broader context of corporate corruption.

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