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Getting back a level playing field under state-guided market economy: Evidence from quake donations by non-state-controlled companies in China

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ABSTRACT

The rise of state-guided market economy is a striking development in the world economy, and China is one leading example. Under China's state-guided market economy, non-state-controlled corporations typically face discrimination in business operations, and have adopted the strategy of making donations to government-favored causes to capture the government, win governments' trust and retrieve a level playing field. With an event study of corporate donations to Wenchuan earthquake relief campaign in 2008, we detect strong and positive market reactions to non-state-controlled donor firms, especially those ex-ante low-efficiency firms operating in regions with a high degree of government intervention, where the ownership-based discrimination is particularly severe and donations can be especially effective in redressing discriminatory treatments. Donor firms also display improvements in long-term performance indicators, which suggests an expansion of business opportunities. We also show that this strategy is fundamentally different from corruption (bribing bureaucrats), and also argue that it differs from corporate political or campaign contributions in mature democracies.

1. Introduction

Corporate donations are an important aspect of strategic corporate social responsibility, which plays an increasingly significant role in firm survival and growth in contemporary market economies. Corporate expenditure on community services, philanthropic programs, environmental protection and employee welfare can create value added for firms through improved corporate image, the goodwill and loyalty of customers, the enhanced employee morale, and the more lenient or favorable treatment by regulators (Navarro, 1988; Godfrey, 2005; Hong and Liskovich, 2015). However, it is much less understood what roles corporate donations play under state-guided market economies, where governments use markets to extend their own political and economic leverage through state ownership and control of enterprises and through allocation of credit to privileged companies (e.g., national champions in key

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industrial sectors), while non-state-owned companies are often disadvantaged in product and factor markets (Musacchio and Lazzarini, 2012; Bremmer, 2010; Megginson, 2017).

Under the model of state-guided market economy, corporate donations are likely to contribute to the realization of the political, economic and social objectives of governments. Consequently, for privately-controlled companies, donations not only improve the corporate image to the public but also signal the loyalty and cooperativeness of corporations to bureaucrats and demonstrate their value and functionality in the pursuit of government-favored causes. This may help corporations capture the government and win the trust of bureaucrats, which subsequently remedies the ownership-type-based discrimination in business operation. Hence, corporate donations could become a powerful instrument of forging a close bond between the business and the government under state guided market economy, and their effects on business operation and firm valuation are likely to stem from an underlying force different from that in free-market economies: retrieving a level playing field in business operation.

We conduct a study of corporate donations in the wake of Wenchuan earthquake in China on May 12, 2008 to investigate this issue. China provides an ideal setting. The country has developed into a leading example of state-guided market economy. The Chinese political system is a leading authoritarian regime, which reinforces the state control of the economy and leads to an authoritarian state-guided market economy model. The rising strength of the Chinese economy, and the similar model pursued by other countries such as Russia, show the prevalence and importance of the state in economy around the world (Musacchio and Lazzarini, 2012; Megginson, 2017). Actually, one of the central contentious points in the U.S.–China trade war or broad-based U.S.–China conflicts is whether China's state-guided market economy leads to a mercantilist economic model that disrupts global trade and facilitates the expansion of China's global political and economic influences, which threatens the Western interests. Taken together, these considerations make it intriguing to investigate the corporate philanthropic behavior to catch a glimpse of the functioning of China's state-guided market economy model.

State-guided market economy or state-guided market economy is often regarded as revealing the preference for stability and aversion to risks (Bremmer, 2010). Although there is no election pressure, an authoritarian regime treats disaster relief efforts as a way to demonstrate state capacity and enhance the political legitimacy of the regime. Thus, organizing timely rescue operations and conducting subsequent reconstruction of quake-hit areas remain on the top of the government's agenda. Three striking features are noteworthy in the relief campaign under China's authoritarian state-guided market economy model. First, the top-down mechanism in China's authoritarian regime prompts subnational governments to support and participate in the relief campaign, which also in nature constitutes to a large extent a tournament among local bureaucrats to show their loyalty to the central leadership. Second, subnational governments often face resource constraints in the relief campaign, and the government-business cooperation through corporate donations can partly help overcome this obstacle. No doubt state-owned enterprises (SOEs) can be a reliable force in the quake rescue operation. Meanwhile, the vibrant sector of non-state-owned enterprises (non-SOEs) plays an instrumental role by making donations to complement government resources. Third, corporate donations can be an effective way for non-SOEs to capture the state. As China's economy is characterized with a strong development-oriented government, non-SOEs which have growth potentials or actively contribute to government-favored courses such as quake relief campaign can demonstrate their value and usefulness to local governments in helping them enhance their administrative performances and achieve their goals in socio-economic development. Consequently, these non-SOEs would win trust and favorable treatments, and gain a level playing field in business operations.

We employ the event study approach to investigate the impact of corporate donations on listed firm valuation in the wake of Wenchuan earthquake. It is found that there were significant positive market reactions to corporate donations made by non-state-controlled companies. In contrast, state-controlled companies' donation decision was likely to be part of the whole relief campaign plan of the government apparatus and was thus largely involuntary. State-controlled companies also had little need to win government's trust through donation. Indeed, we find that state-controlled donor firms did not experience significantly stronger stock market reactions than those state-controlled non-donor firms. In this study, we therefore mainly focus on the voluntary donations made by non-state-controlled companies.

We then further look at the market responses to non-state-controlled donor firms located in regions with variations in government intervention in the economy, and find that the significant positive valuation effects only existed for those companies that donated by the CCTV philanthropic party on May 18 and showed great initiatives and sincerity in donation. The positive market reaction was also confined to those firms operating in regions with a high (above-mean) degree of government intervention. We interpret it as those regions had a stronger discrimination against non-SOEs, and once redressed, the expected gain to donor firms from achieving a level playing field was also more salient. Moreover, we find that the positive market reaction was stronger for companies operating in industries with high government contracting intensity and for companies facing more serious financial constraint. This indicates that the market expected these companies to have chances to win government favors and obtain government projects and formal finance after donation.

Furthermore, we analyze the changes in operating performance indicators of donor firms from the three years before to the three years after corporate donations, and compare them with the corresponding changes of non-donor firms. Donors displayed significant improvements in total sales, total costs, the ratio of sales to costs, the amount of loans obtained, the size of on-going projects, and the amounts of fixed assets and total assets. Moreover, listed firms in regions with a higher degree of government intervention, operating in industries with a higher government intensity and facing more serious financial constraint initially exhibited more significant improvements in those performance indicators, which suggests an expansion of business opportunities, government procurement contracts and access to external finance. These results are consistent with and substantiate the findings from market response analysis.

The positive market reactions were likely to result from the improved corporate image as socially responsible businesses in the eyes of the public, which would boost corporate sales but was not peculiar to a state-guided market economy model. Nonetheless, the concentration of companies with favorable changes in regions with high government intervention and bureaucratic discretion points to

the role of corporate donations in helping facilitate business development under state-guided market economy. We interpret these findings as suggesting that corporate donations can serve as one instrument of non-SOEs' capture of the state to achieve government-business cooperation and get back the level playing field. Compared with SOEs that are favored by governments, non-SOEs are typically disadvantaged in resource allocation (such as obtaining bank credit) in an economy dominated by the government. Non-SOEs, however, can conduct philanthropic activities to support government-favored causes and show their allegiance, value and usefulness to the government, which help retrieve a level playing field.

We further explore the efficiency implications of the quake donation campaign. We divide the sample firms into high-efficiency (with above-median performance in the years prior to donation) and low-efficiency (with below-median prior performance) groups. Both groups did not exhibit significant differences in the firm-size-adjusted amounts of donation, which negates the view of an efficiency-based donation campaign in which more efficient firms donated more and were rewarded more. Furthermore, it is primarily the low-efficiency donor firms headquartered in regions with a high degree of government intervention that exhibited a striking improvement in market reactions, access to resources and operating performances after making donation. These firms could have been much more disadvantaged in resource allocation in regions with high government intervention in the pre-donation period, and the rectification of discrimination in product and input markets in the post-donation period bolstered their performances most strikingly.

We further compare quake donations with bribery, an illegal and illegitimate means of state capture. Interestingly, donor firms in both high and low-corruption regions displayed significant improvements in access to resources and firm performances, and low-efficiency donor firms produced a more striking pattern. Moreover, low-efficiency firms in low-corruption regions exhibited the most salient improvement. This shows that quake donation campaign was not simply a bribery race, and bribery might not be the most important instrument of non-SOEs in carrying out state capture. Helping local governments achieve growth and other socioeconomic goals and deliver administrative performance could be an effective and legitimate means of state capture in China's development-oriented state-guided market economy model. In [Sections 5.6 and 5.7](#), we further discuss the relations of corporate donations to bribery and corporate political contributions.

This study employs the case of quake donation to explore the nature and functioning of the government-business relationship under China's authoritarian state-guided market economy. It adds to a growing line of literature on state-guided market economy or state-guided market economy (e.g., [Baumol et al., 2007](#); [Li and Shaw, 2013](#); [Musacchio et al., 2015](#); [Li et al., 2015](#)). It is also related to a growing literature on corporate philanthropic responses to disasters. The existing studies mainly examine the determinants of corporate donations to disaster relief. They document a link between corporate donations and firm size, profitability, cash resource constraint, geography, leverage and industry (see, for example, [Amato and Amato, 2007](#); [Brammer and Millington, 2005](#)). [Shan et al. \(2008\)](#), [Gan and Shan \(2010\)](#), [Zhang et al. \(2010\)](#), and [Zhang et al. \(2010\)](#) are close to our study in the sense that they also study corporate donations after Wenchuan earthquake. Nonetheless, they all focus on examining what factors prompt firms to donate. [Shan et al. \(2008\)](#) and [Gan and Shan \(2010\)](#) point out the importance of advertising motives as firms engaged in consumer-oriented industries were more likely to donate. [Zhang et al. \(2010\)](#) find a positive correlation between firm advertising intensity and the probability and the amount of corporate giving. [Zhang et al. \(2010\)](#) find that state-owned firms donated less and were less likely to donate than did privately-owned firms, but they did not go deeper in detecting the underlying rationale.

In addition, our study is related to several studies of the impacts of corporate donations to disaster relief on firm valuation. [Muller and Kräussl \(2008\)](#) use event study methodology to investigate stock market reactions to corporate donation announcements by 108 U.S. firms made in response to Hurricane Katrina. They show that overall, corporate donations were linked to neither positive nor negative abnormal returns. [Pattern \(2008\)](#) investigates the market reaction to corporate press releases announcing donations to the relief effort following the December, 2004 tsunami in Southeast Asia. Results from Pattern's sample of 79 U.S. companies indicate a statistically significant positive 5-day cumulative abnormal return, and the amount of the donations influenced the size of positive market reactions. Our study examines the market reaction to corporate donation in the context of China's authoritarian state-guided market economy and examines region-level heterogeneity in market reactions, which sheds new light on the issue.

Moreover, this study is related to the literature on whether corporations make political or campaign contributions to gain access to politicians and buy influence in legislation and regulation. As discussed in [Section 5.7](#), although corporate donations to quake relief may indirectly improve the chances of promotion of bureaucrats in China, corporate campaign or philanthropic contribution in the U.S. is still fundamentally different in nature from quake donations in China. Even within this line of literature, the findings on whether corporations buy political favors remain mixed ([Ansolabehere, et al., 2003](#)). For example, [Kalla and Broockman \(2016\)](#) and [Bertrand et al. \(2020\)](#) find positive political access or political influences for donors. In contrast, [Fowler et al. \(2017\)](#) find that corporate campaign contributions do not appear to buy significant political favors. In contrast, we find sizeable value gains to quake donor firms.

The rest of the paper is organized as follows. [Section 2](#) provides a background for various conceptual issues discussed in the paper. Data and variables are introduced in [Section 3](#). [Section 4](#) illustrates the empirical strategy. [Section 5](#) presents and discusses the results. [Section 6](#) concludes the paper.

2. Background

2.1. Wenchuan earthquake

The earthquake with Wenchuan County in Sichuan province as its epicenter occurred on May 12, 2008 and was the deadliest earthquake to hit China since the 1976 Tangshan earthquake. It caused severe casualties, with nearly 70,000 people confirmed dead, 18,000 people missing and more than 370,000 people injured.

The Chinese government conducted rescue operation swiftly and with uncharacteristic openness (The Economist, "Days of

Disaster”, May 15, 2008). President Hu Jintao directed the disaster rescue operation. Just 90 min after the earthquake, Premier Wen Jiabao, flew to the earthquake area to oversee the rescue work. Soon after the quake, the Ministry of Health sent ten emergency medical teams to Wenchuan County (TIME, “China’s Quake Damage Control”, May 13, 2008). As the quake region was poor with little or no insurance, the Chinese government picked up the costs of care to earthquake victims (Associated Press, “Long Wait for Medical Care after China Quake”, May 15, 2008). On the same day, the Chengdu Military Region Command dispatched 50,000 troops and armed police to help with disaster relief work in Wenchuan County (Bloomberg, “50,000 Troops Deployed”, May 12, 2008).

Following the earthquake, corporate, organizational and individual donations were actively launched. People from all over the Chinese mainland made donations (Wall Street Journal, “Chinese People Open Their Hearts and Wallets Following Earthquake”, May 15, 2008). The donations, especially corporate donations, reached a climax on the evening of May 18 when the Chinese central government and China Central Television Station (CCTV-1) hosted a special four-hour program called *The Giving of Love*. It featured a wide range of entertainment, literary, business and political figures from mainland China, Hong Kong, Singapore and Taiwan. Entrepreneurs actively made donations that evening, and the total amount hit 1.5 billion Chinese Yuan (approximately US\$208 million).

Furthermore, the Chinese government launched a massive quake region reconstruction campaign. In June 2008, the State Council established a counterpart support plan, in which 19 eastern and central provinces and municipalities were arranged to help the 18 quake-hit counties in Sichuan province and other affected areas in Gansu and Shaanxi provinces on the “one province to one affected county” basis. The plan spanned 3 years, and cost no less than one percent of the province or municipality’s budget. In November 2008, the Chinese government announced that it would spend 1 trillion RMB (about US \$146.5 billion) over the next three years to rebuild areas ravaged by the earthquake. In 2012, the restoration and reconstruction were claimed to have been completed.

2.2. State-guided market economy

In general, the role of the state in market economies is mainly reflected in government regulations and state ownership of business. Both are extensive and pervasive in modern market economies (Baumol et al., 2007; Bortolotti and Faccio, 2009). The role of the state versus the market indeed varies considerably across countries (see, e.g., Shleifer, 1998; La Porta et al., 1999; Djankov, et al., 2003) and across different regions in China (Du, Lu and Tao, 2014).

State-guided market economy or state-guided market economy is a variety of market economy or capitalism where markets are primarily seen as a tool to serve national interests or at least those of ruling elites rather than an engine of opportunities for the individual (Baumol, et al., 2007; Bremmer, 2010). Under state-guided market economy, governments exercise control directly and indirectly over resource allocation through instruments such as government ownership and control of key economic actors, government directives, extensive regulations, and control over factor and product markets. In recent years, state sector contributes a large portion (approximately 20–30 %) of GDP and total stock market capitalization in some economies such as Brazil, China, Russia, and Vietnam (Musacchio and Lazzarini, 2012), which exhibit notable characteristics of state-guided market economy.

China is a leading example of state-guided market economy. A defining feature of the official Chinese economic model, *the market economy with Chinese characteristics*, is in nature *Chinese-style state-guided market economy*, which involves the extensive undertaking of economic activity by the State in the form of widespread state ownership, industrial policies, government subsidies to national champions, and control and regulations of businesses. Despite over forty years of economic reforms, China has retained a significant proportion of SOEs or state-controlled corporations in most industries. In the period 1993–2002, China carried out SOE privatization, corporatization and modernization, and a significant number of medium-sized and small SOEs were restructured and privatized. Meanwhile, the government preserved and expanded state ownership and spurred the selection and cultivation of “national champions” out of the large pool of SOEs, especially in strategic sectors. The restructuring and reorganization boosted the power of many SOEs: large SOEs that were already market leaders individually were merged by the state to create behemoth national champions. Currently, many of them are listed among the world’s largest companies. In 2020, China has the largest number of companies represented in Fortune Global 500, outpacing that of the U.S. Moreover, the government significantly strengthened the role of the Chinese Communist Party (CCP) in SOEs through the creation of party committees with major decision-making power in the boards. This tighter control of SOEs by the party-state strengthens state-guided market economy capitalism. At the same time, China has developed its non-state-owned economy including domestic private firms and foreign multinationals on the margin (Bai et al., 2000). This situation is likely to continue and get reinforced in the future. According to the political report delivered by President Xi Jinping in the 19th National Congress of the CCP, held in Beijing from October 18 to 24, 2017, China will stick to the national strategy of keeping the dominant position of state ownership in its economy, and will support state capital in becoming stronger, doing better and growing bigger.

SOEs enhance the state capacity in achieving economic development and social objectives, e.g., pursuing industrial policies to nurture industries with strategic importance, and maintaining social stability through job creation. SOEs also facilitate bureaucrats to pursue their political agenda and help them seek bureaucratic promotion and rents. It is therefore not surprising that the government usually gives priority to SOEs in resource allocation through state apparatus, whereas non-state-owned firms have much less chances of participating in state initiatives and have disadvantaged access to resources such as subsidized loans (Musacchio and Lazzarini, 2012).

The unlevel playing field between SOEs and non-SOEs has been a striking phenomenon in China’s economic transition and development. According to Sheng and Zhao (2012) and Unirule Institute of Economics (2015), the recorded profitability of SOEs is not a reflection of their real performance, but primarily the result of numerous preferential policies toward SOEs reflected in fiscal subsidies, subsidized loans, and privileged access to land and natural resources. Provided SOEs will keep their dominant position in the national economy, the uneven playing field for non-state-owned firms is most likely to persist.

2.3. Government responsiveness to natural disasters in an authoritarian regime

The government reaction to natural disasters and its capacity to conduct rescue activities is an important indicator of state capacity and regime legitimacy. In democracies, electoral competition may create pressure on the accountability of government officials and prompt national and subnational governments to be responsive to citizens' needs of disaster relief (see, e.g., Besley and Burgess, 2002; Eisesee and Stromberg, 2007; Healy and Malhorta, 2009; Cole, Healy and Werker, 2012). In China's authoritarian regime, there is no meaningful electoral competition. Nonetheless, the political leadership still places much emphasis on natural disaster relief efforts because they are an important way to demonstrate state capacity and to enhance the political legitimacy of the ruling party. First, the Communist ideology dictates that the CCP is the loyal representative of the fundamental interests of the people. Disaster relief is a good occasion to substantiate and prove this claim. Second, the ideas of morality and benevolence of the Chinese traditional culture, especially the doctrines of Confucianism, contain the principle of reciprocity, i.e., the people will support the leadership and the regime as long as they are taken care of during hard times (Wright, 1960). This is also consistent with the social exchange theory. This strengthens the incentive of the authoritarian regime to adopt swift rescue actions.

Consequently, in the wake of Wenchuan earthquake, the Chinese central leadership organized the rescue and relief campaign rapidly and efficiently. In China's authoritarian regime, the top-down mechanism prompts sub-national governments to follow suit to provide financial assistance and other forms of support to the rescue campaign.

The whole quake relief campaign orchestrated by the central government has achieved several goals. First, the campaign has demonstrated the state capacity and increased the legitimacy of the regime. It helped display the willingness and the ability of the leadership to handle major emergency events, which is one key aspect of state capacity.

Developing countries are particularly vulnerable to the huge direct costs of natural disasters in terms of both casualties and property damage, largely because they lack resources for prevention efforts, and have weak enforcement of mitigation rules, e.g., building codes, land-use planning, and engineering intervention (Cavallo and Noy, 2009). As the Wenchuan earthquake hit a poor region with below-national-average income, the lack of market solutions dictates that the state action plays an instrumental role in providing social protection to vulnerable populations. Moreover, the quake region involves a large proportion of ethnic minority people. The political demand for the central government responsiveness to calamity is even more acute. Since disaster relief spending is much more effective in enhancing political legitimacy than does the investment in disaster preparedness (Healy and Malhorta, 2009), it is not surprising that the government would mobilize tremendous amounts of resources for the disaster relief efforts.

Second, the active participation of the sub-national governments in the relief campaign exhibits that the pressure of central government supervision works well in prompting the compliance of the local governments with the central government's command and the respect of the sub-national governments for the central government. The state-controlled media typically announced on a daily basis a group of best-performing provinces that made sizeable donations to the campaign, which added to the pressure of a *de facto* donation tournament among regions. This can enhance the authority of the central leadership and the unity of the entire administrative system. As the central government keeps the power to appoint, promote, replace or remove subnational government officials, the quake relief participation of sub-national governments constituted to some degree a tournament among local bureaucrats to show their support and loyalty to the central leadership. For this reason, it is not only the central leadership but also the sub-national leadership that are keen to promote quake relief contributions from various sectors.

Third, to a large degree, the relief campaign widely participated by the subnational governments, the private sector and the public greatly alleviates the concern that the central budget cannot accommodate the financial needs of the relief program. In Imperial China, natural disasters sometimes led to rebellions because the government did not have sufficient resources to provide state protection for the people and thus lost its legitimacy (McKnight, 2013). This historical lesson keeps reminding the current leadership of the importance of providing state protection and addressing the concerns of the people after natural disasters occur. The financial contributions of sub-national governments complement the central fiscal outlays in the rescue and reconstruction efforts. Donations by firms and individuals also helped the governments to achieve the success of quake relief campaign. It is reported that within six months after the Wenchuan earthquake the donation amounted to 76.2 billion yuan nationwide, and approximately 80 % of the donation funds flowed to the accounts of governments at various levels.¹ This shows that donations helped the Chinese government considerably in its quake relief campaign. At the same time, a study of quake relief campaign can shed light on the puzzling durability of the Chinese authoritarian regime and the nature of the state-guided market economy in China.

2.4. Quake donations and state capture

An authoritarian state-guided market economy model does not mean only SOEs could be supported by the government. Some non-SOEs still managed to receive support and subsidies from the government through state capture, i.e., firms obtained favorable treatments from the national or local governments by aligning themselves with the political leadership's interests, goals, and priorities. The means by which non-SOEs obtained these advantages could be varied. Some firms may utilize familial, personal and professional connections and even bribery to capture the state (Milhaupt and Zheng, 2015). For instance, firms could take advantage of political connections built upon the previous bureaucratic experience of corporate executives or directors or their social network connections to bureaucrats, and even bribe bureaucrats, in order to obtain privileged treatments from bureaucrats.

¹ For a report on this, please refer to <http://www.chinahush.com/2009/08/13/80-percent-of-the-earthquake-relief-donation-went-to-the-chinese-government/>.

However, under China's authoritarian state-guided market economy with a powerful government system, non-SOEs are likely to win government trust and support legally and legitimately by proving that they are valuable and useful to the government in helping it fulfill various socioeconomic obligations. In the reform era, China is characterized with fiscal and economic decentralization and political centralization, and the yardstick promotion competition scheme based on criteria such as GDP growth, social stability or environmental protection gives tremendous incentives to local governments to pursue policies that could enhance their administrative performances. Consequently, the government is forced by the yardstick competition to look beyond SOEs in bolstering its capability to achieve its performance goal. For instance, the growth imperative prompts bureaucrats to favor firms with growth potentials. Those star non-SOEs, such as Geely Auto Group and Huawei, could be valuable to local bureaucrats, and they would receive government support and subsidy (Milhaupt and Zheng, 2015).

By the same logic, those non-SOEs, which were active in assisting local governments in the quake relief tournament, helped bureaucrats fulfill their broad-based political and social obligations, and thus deserved the trust from and favorable treatment offered by the local governments. The institutional features of China's state-guided market economy model, i.e., the massive state intervention and the lack of procedural checks on the ultimate authority of the party-state throughout the economic system, provide flexibility and leeway for local governments to extend privileged treatments to those captor non-state-controlled firms and help them retrieve a level playing field. This also cultivates an institutional ecology that encourages non-state-controlled firms to remain close to the government as a source of protection and largesse.

3. Data and variables

3.1. Data

The information on the donations made by listed firms in the wake of the Wenchuan earthquake was collected from several sources: (1) corporate announcements on special corporate donations for the earthquake victims; (2) information on corporate donations for earthquake relief that was released in the relevant companies' websites; (3) information disclosed by media news reports on earthquake donations made, typically, by a group of corporations; (4) donations announced by firms in the earthquake relief fund raising party called *The Giving of Love* organized by the CCTV on May 18, 2008.

The information collected on corporate donations includes the date of the donation made, the date of the public announcement or media coverage of the corporate donation, the amount of the donation (donation size), and the types of donation (i.e., in-kind/materials donation or cash donation).

Since we are interested in investigating how government-business relations under state-guided market economy shaped the investors' perception of corporate donations, we will mainly consider non-state-controlled listed firms whose donation decisions were relatively independent of governments' explicit or implicit executive order. In Section 5.2, we will briefly discuss the findings for state-controlled listed firms. Eventually, we obtained the information on donations made by 1379 non-state-controlled listed firms. If a company made multiple donations, we only consider the first donation it made in the event study analysis.

The data on individual stock trading came from the Dataset on Stock Prices and Returns in China's Capital Markets produced and maintained by the SinoFin Financial Information, a financial data company, and China Center for Economic Research (CCER), Peking University. The firm-level stock returns are individual companies' daily stock returns that are adjusted for distributions and splits. The market return is daily market return derived on the basis of the Shanghai Shenzhen CSI 300 index, which is a widely-used capitalization-weighted stock market index designed to replicate the performance of 300 stocks traded in the Shanghai and Shenzhen stock exchanges.

By combining the firm-level donation data with the individual stock trading data, we obtained a balanced panel data set which covered 1230 firms and 600 continuous trading days for each firm (i.e., approximately 340 pre-event trading days as estimation window to derive the estimated beta coefficient for each firm, and six calendar months both before and after the quake as event window).

We collected the basic firm attributes and financial information from both the China Stock Market and Accounting Research (CSMAR) dataset and the above-mentioned SinoFin-CCER dataset. Firm attributes include the location of its operation, industry affiliation, the year when a firm got listed, and the proportion of stock ownership of the controlling stockholder. Firms' financial information encompasses total sales, total costs, loans, construction work and business projects in progress, fixed assets, total assets, ROA, and operating income.

To identify state-controlled companies and non-state-controlled ones, we made use of the information on the controlling shareholder from the CSMAR dataset and cross-checked by the complementary information on the ownership nature of the ultimate controlling shareholder from the above-mentioned SinoFin-CCER dataset. If the ultimate controller is a state entity, i.e., a state-owned enterprise or a government entity, we treat the firm as state controlled; otherwise the firm is regarded as non-state controlled, which includes privately-controlled companies, collectively-controlled ones, foreign-controlled ones, and shareholding employees-controlled ones.

3.2. Variables

In the event study, we use the market model to compute normal returns for individual stocks. We use the trading period (-470, -131), that is, 470 to 131 trading days prior to the earthquake day as the estimation window to derive the typical relationship between the firm's stock return and the market return through regression analysis. On the basis of the estimates of the beta coefficients, the daily

normal returns are projected and then used to calculate the abnormal returns for the event window from trading days -130 to 130. In the part of robustness tests, we replace daily abnormal returns with monthly cumulative abnormal returns, which are the sum of daily abnormal returns in each period of 20 trading days for each firm.

In studying the stock market responses to corporate donations, the abnormal returns of individual company stocks are the key dependent variable. One primary explanatory variable is the interaction term between the indicator variable of donor firms and the indicator variable of the period after the date of public disclosure of the donations, which captures the effect of donation making on corporate donors' stock returns relative to the non-donor firms. To capture the impact of the amount of donations on market reactions, in some parts of the analysis, we replace the indicator variable of donor firms by the amount of donation, *Donation Size*, which is the amount of cash donations scaled by the mean value of the firm's operating income over the period 2005–7 and reflects how large a fraction of operating income the firm is willing to take out to donate to the quake regions.

In our sample, of 740 non-state-controlled firms making donations after the quake, 664 firms made donations once, 69 firms twice, and the remaining corporations donated more than twice. For firms having donated more than once, we use the average amount of donations. As we treat the period after the first donation as the post-donation period while we use the mean value of multiple donations to compute *Donation Size*, we try to mitigate the concern of the mismatch of the two types of data by dropping those firms with more than one donation in the robustness check, and the results are qualitatively the same.

In investigating what kinds of listed firms made donations, we carry out probit regression analysis. The dependent variable is an indicator variable that takes value one when a firm donated and zero otherwise. The explanatory variables include several categories. The first category is the prior accounting performance measures, i.e., the logarithm of the mean return on assets (ROA) over the period 2005–7 and the logarithm of the mean operating income in the years 2005–7. The second category is the prior stock performance of individual companies, which include the mean abnormal returns in the 20 trading days before the earthquake (from day -20 to day 0), in the 60 trading days before the earthquake (from day -60 to day 0), and in the 120 trading days before the quake (from day -120 to day 0). We consider these two categories of explanatory variables mainly to examine whether firms with better corporate accounting performance and stock market performance before the earthquake were more likely to donate. If so, it may suggest the existence of reverse causality, that is, if firm performance and accounting performance exhibited momentum, better performing firms were more capable of making donations. Thus, it is not donation that affected firm performance but rather the other way around.

We also consider the corporate leverage ratio (the mean ratio of debt to assets over the period 2005–7), whether the company was state-controlled, i.e., the ultimate controller was a state entity, whether the firm was located in the quake regions (Sichuan and Chongqing), and whether the firm was engaged in consumer-oriented industries. Firms operating in quake regions might have a stronger sense of obligation to donate to fulfill their social responsibility.

Corporate donations could be motivated by the fulfillment of corporate social responsibility so as to improve corporate image and facilitate product sales. This motive was likely to be particularly strong for firms engaged in consumer-oriented industries or heavily-polluting industries. For consumer-oriented industries, donor companies might intend to win the hearts of consumers and expand product sales by exhibiting their sense of social responsibility. Thus, making donations became part of their advertising or marketing strategy. Following [Gan and Shan \(2010\)](#), we define an industry as consumer-oriented if the products of the industry are directly sold to consumers. The list of consumer-oriented industries is contained in Panel A of Appendix Table A1, which range from food and

Table 1
Definition of variables.

Variable	Description	Source
Abnormal return	Abnormal stock return	S
Donation indicator	An indicator variable that takes value one if company <i>i</i> made quake donation and zero otherwise	D
Cash donation indicator	An indicator variable that takes value one if donor company <i>i</i> made cash donation and zero if it made in-kind donation	D
Meanabr20	Mean Abnormal Return in the 20 trading days before donation	S
Meanabr60	Mean Abnormal Return in the 60 trading days before donation	S
Meanabr120	Mean Abnormal Return in the 120 trading days before donation	S
ROA	Average value of natural logarithm of return on assets over three years before donation	D
Number of listing years	Number of years since listing	D
Operating income	Average value of natural logarithm of operating income over three years before donation	D
Consumer-oriented industry	Consumer-oriented industry indicator	D
Polluting industry	Heavily polluting industry indicator	
Debt to asset ratio	Average value of natural logarithm of debt to assets ratio over three years before donation	D
Quake region firms	Quake region firm indicator taking value one if a firm is located in Sichuan or Chongqing and zero otherwise	D
Cash donation size	Donor firm <i>i</i> 's donation value scaled by its operating income	D
Sales	Natural logarithm of total sales	C
Costs	Natural logarithm of total costs	C
Sales/costs	Natural logarithm of the ratio of total sales to total costs	C
Assets	Natural logarithm of total assets	C
Fixed assets	Natural logarithm of fixed assets	C
Loans	Natural logarithm of the sum of long and short term loans	C
Ongoing projects	Natural logarithm of the value of ongoing projects	C

Note: This table reports the variables used in our regression analyses and their description. Data sources: D=donation information data; S= Dataset on Stock Prices and Returns in China's Capital Markets produced and maintained by the SinoFin Financial Information; C= China Stock Market and Accounting Research (CSMAR) dataset.

beverage, household and personal products, automobiles, finance and insurance, retail, real estate, social services, to communication and cultural industries.

In addition, firms in heavily-polluting industries are typically viewed as lacking corporate social responsibility by the public. They might have a strong incentive to make donations to soothe the public's discontent and improve corporate image. We identify a group of heavily-polluting industries based on the *Guideline on Environment-related Information Disclosure for Listed Firms* issued by the Ministry of Environmental Protection in September 2010, and the list is contained in Panel B of Appendix Table A1.

In the part of the analysis of corporate performances, we examine the logarithm of the values of the following variables: total sales, total costs, the ratio of sales to costs, the amount of loans (i.e., the sum of long-term loans and short-term loans from banks and other financial institutions), the size of ongoing projects (i.e., construction work and business projects in progress), fixed assets, and total assets. Table 1 provides the definition and the sources of the variables we use. The summary statistics of some key variables are presented in Table 2.

4. Empirical strategy

4.1. Event study method

Inspired by Lee and Mas (2012), we employ a relatively long panel (up to six months) of high frequency data on daily stock returns for each firm, and carry out DID analysis by comparing the evolution patterns of abnormal stock returns for the treatment group firms (i.e., donor firms) and the control group firms (i.e., non-donor firms). This long panel dataset allows us to examine stock returns over several months beyond the donation event so as to capture the relatively long-term effects of corporate donations. This enables us to not rely heavily on the assumption that the stock price immediately and instantaneously adjusts to capture the expected impacts of donation on corporate valuation, which is particularly meaningful and relevant for emerging market economies like China where the information efficiency of stock market prices is weaker than that in advanced economies.

The objective of our study is to assess the impact of corporate donations in the wake of the earthquake on the stock market value of firms. Ideally, we would like to compare a donor firm's stock returns with the returns the firm would have experienced in the absence of donation. The event-study method provides a good approach to estimating this counterfactual return.

The abnormal return is defined as the difference between a stock's actual return and the expected return given the stock's sensitivity toward market risk. To derive the expected return, we employ the widely-used market model, i.e.,

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where R_{it} is the actual return of firm i on day t , R_{mt} is the market return on day t , and ε_{it} is the error term. β_i measures the sensitivity of firm i 's returns to market risk. Based on the returns data in the estimation window (-470, -130), we obtain the estimates of β_i for firm i , and use the estimated beta coefficient to compute the normal returns $E[R_{it}]$ on day t in the event window for firm i .

For a donor company i , the abnormal return (AR) on day t in the event window is

$$AR_{it} = R_{it} - E[R_{it}]$$

To mitigate the concern that abnormal returns with large magnitude on some trading days may cast big impacts on our regression analysis, we also use monthly cumulative abnormal returns (CAR) in the robustness check. The monthly CAR is the sum of daily

Table 2

Summary statistics of some key variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Abnormal return	321,030	0.001	0.038	-0.555	11.647
Donation indicator	1387	0.596	0.491	0.000	1
Cash donation indicator	827	0.672	0.470	0	1
Meanabr20	1387	0.000	0.017	-0.042	0.565
Meanabr60	1387	0.000	0.007	-0.051	0.188
Meanabr120	1387	0.002	0.005	-0.043	0.094
ROA	1362	0.100	1.451	-1.675	27.780
Number of listing years	1387	2.161	0.507	0.693	2.833
Operating income	1370	20.732	1.469	12.685	27.647
Consumer-oriented industry	1370	0.142	0.350	0.000	1
Debt to asset ratio	1360	-0.686	0.584	-3.086	5.769
Quake region firms	1387	0.094	0.292	0.000	1.000
Cash donation size	1387	0.001	0.012	0.000	0.432
Sales	9286	20.814	2.130	0.000	28.550
Costs	9279	20.872	1.557	12.570	28.511
Sales/costs	9275	-0.052	1.074	-19.403	2.110
Assets	9292	21.534	1.473	0.000	29.160
Fixed assets	9292	19.806	2.070	0.000	27.062
Loans	9158	17.945	6.006	0.000	25.637
Ongoing projects	9199	15.026	6.553	0.000	28.550

Note: This table provides summary statistics for some key variables in the study.

abnormal returns in each period of 20 trading days for each firm, i.e.,

$$CAR_{it1t2} = \sum_{\tau=t1}^{t2} AR_{it\tau}$$

4.2. Estimation specifications

To identify the possible effects of donations for Wenchuan earthquake on firm valuation, we mainly follow [Lee and Mas \(2012\)](#) to employ the DID estimation strategy in conducting event study. We also carry out DID analysis for accounting-based firm performance indicators. Specifically, we exploit two sources of variations: time variation (the first difference, i.e., before and after the date of donation) and cross-sectional variation (the second difference, i.e., non-state-controlled listed firms making donations or the treatment group, and non-state-controlled listed firms making no donation or the control group). The identification relies on the comparison of outcome variables for the treatment group with those of the control group, both before and after the Wenchuan earthquake.

The main estimation specification is

$$y_{it} = \beta Treatment_i \times Post_t + \lambda_i + \lambda_t + \varepsilon_{it} \quad (1)$$

where y_{it} is the outcome variable of firm i in date t ; $Treatment_i$ is a dummy variable taking the value of 1 if firm i belongs to the treatment group of donor firms and 0 otherwise; $Post_t$ is also a dummy variable taking the value of 1 during the periods after a firm made donations and 0 otherwise; λ_i is the firm dummy capturing all time-invariant firm characteristics; λ_t is the date dummy capturing all time-variant factors common to all firms on the same date; and ε_{it} is the error term. The coefficient of interest in this study is β . To deal with the potential heteroskedasticity and serial correlation, we cluster standard errors at the firm level (see [Bertrand, Duflo, and Mullainathan, 2004](#)).

For this study, we consider two sets of outcome variables: (1) company stocks' abnormal returns, which are derived from the market return based on the composite index of the two stock exchanges in China, and (2) firms' accounting performance variables, such as logarithm of the value of total sales, total costs, the ratio of sales to costs (as a proxy for profits), ongoing projects, loans (long-term loans plus short-term loans), total fixed assets, and total assets.

One may be concerned that firms in the treatment group and their counterparts in the control group may follow different time trends in their outcome variables. To address this concern, we allow for firm-specific time trends in our estimation specification, i.e., the inclusion of additional controls $\lambda_i \times t$, as shown below:

$$y_{it} = \beta Treatment_i \times Post_t + \lambda_i + \lambda_t + \lambda_i \times t + \varepsilon_{it} \quad (2)$$

5. Empirical results

5.1. The effects of donations on abnormal returns

We begin by investigating the effects of donation for Wenchuan earthquake on firms' abnormal returns. First, we conduct a simplified version of DID regression that includes date and firm dummy variables only to examine the differences in abnormal returns between donor and non-donor firms before and after the donation event (day 0). [Fig. 1](#) plots the time series of the estimated coefficients of the interaction term of donor firm indicator and day dummies with 5 % confidence interval. It is observed that the difference in the daily abnormal returns between the treatment and control groups had hovered around zero and displayed no clear trend before the date of each firm's donation. However, there emerged a salient trend of positive and enlarged differences between the treatment and control groups after corporate donation announcements, which attests to a positive effect of corporate donation making on firm valuation.

Next, more formally, we follow [Card and Krueger \(1994\)](#) to carry out a regression to compare the abnormal returns of the donor firms and those of their control firms in the pre-donation period or the pre-quake period. Table A2 shows that there was no statistically significant difference in prior stock market performances between the two groups of firms before making donations and before the earthquake, respectively. To have a nuanced view of the stock return changes, we conduct dynamic DID event study of five months before and after corporate donation on the basis of monthly cumulative abnormal returns (CARs). Table A3 presents the regression results, which also provide support to the parallel pre-donation trends for the treated firms and control group firms. These results are consistent with the daily abnormal return results illustrated in [Fig. 1](#).

Regression results corresponding to the main estimation specification (1) (referred to as Specification 1) and the additional estimation specification (2) (referred to as Specification 2) are reported in [Table 3](#). We identify the impact of donations on firms' abnormal returns using three different event windows: event windows (-120, 120), (-60, 60) and (-20, 20), namely, the period from the 120th, 60th, and 20th trading day before the date of donation (day 0) to the 120th, 60th, and 20th trading day after the date of donation, respectively. Panel A of [Table 3](#) presents the estimation results obtained using all those non-state-controlled firms that did not donate as the control group (referred to as Control Group 1). We find that, for both Specifications 1 and 2, the impact of donation on firms' abnormal returns was positive and statistically significant for each of the three event windows. In terms of the magnitude of the impact, compared with the control group, donation led to an average increase in firms' daily abnormal return by around 0.30 %.

One may be concerned that the donation decision by firms could be endogenous. For example, firms in the treatment group tended to be larger or better-performing firms, which might lead to biased estimation of the donation effect. To address this concern, we

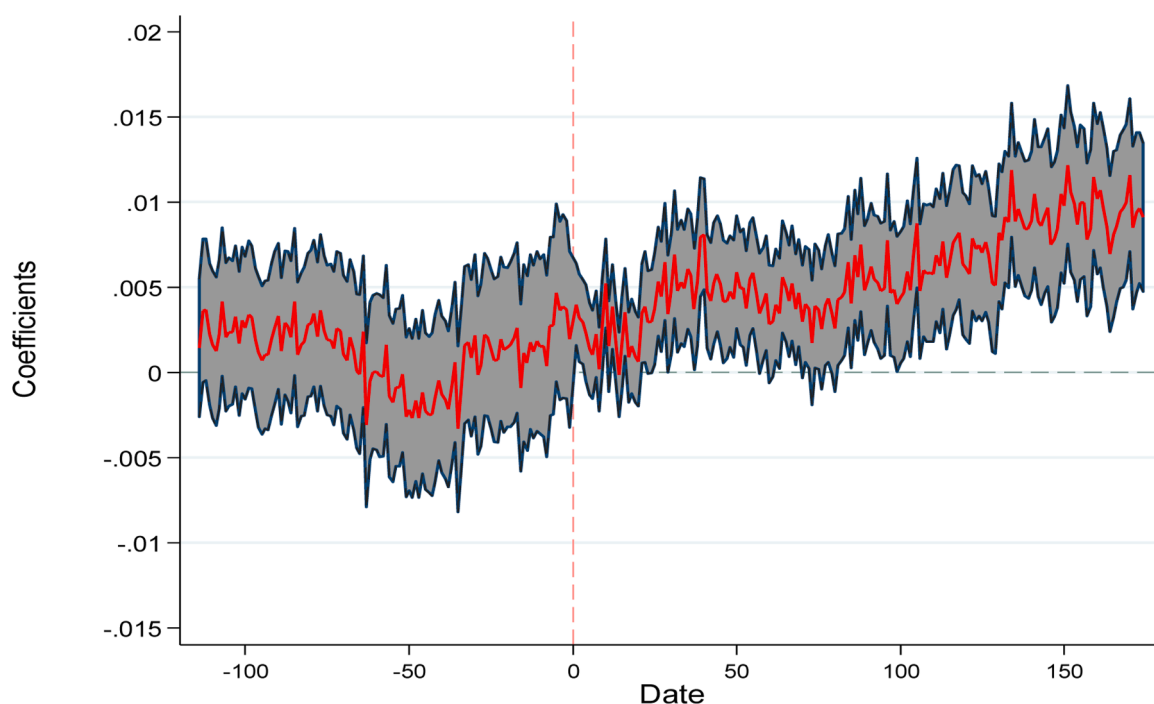


Fig. 1. Abnormal Return around Donation.

Note: This figure shows the estimated coefficients of the interaction term $\text{Donation Indicator}_i * \text{Date}_t$ with 5 % confidential intervals, which indicate the differences in abnormal returns between donor and non-donor firms before and after the donation event (day 0). Date and firm dummies are added; standard errors are clustered at the firm level.

attempt to form a matched control group wherein firms had a similar propensity to make quake donations as did the donor firms. To do so, as a first step, we look into the possible determinants of firms' donation decision. We consider several types of potential determinants: (1) companies' prior stock market performance; (2) companies' prior accounting-based performance, e.g., return on assets (ROA); (3) how long a company had been listed; it is likely that more recently listed firms had a stronger propensity to donate to build up their corporate images; (4) companies' productivity; (5) industry dummy; companies operating in consumer-oriented industries might be more likely to donate because they tended to use donation as an advertisement strategy to enhance customer loyalty and win over prospective customers; and companies in heavily-polluting industries might exhibit a stronger tendency to donate because they tended to use donation to improve their corporate image; (6) region dummy; on the one hand, a company from the quake region could incur losses during the earthquake, which might curb its ability to donate; on the other hand, a company from the quake region could have a stronger sense of social obligation to donate for the welfare of the local community; (7) some other firm attributes such as firm size,² firm cost, capital mobility and corporate leverage; larger firms with higher visibility and social influence were more likely to take the lead in quake donation; firms with a higher leverage, higher cost, or lower capital mobility might have less cash reserve available for quake donation.

As shown in **Table A4**, a firm was more likely to donate if it had been listed for a shorter duration, had larger sales and asset bases (indicating larger firm size), and exhibited lower operational costs, smaller fixed assets (suggesting higher capital mobility), and lower productivity levels. Notably, a firm's donation decision was not related to or shaped by its mean abnormal return experienced in the prior trading periods of (-20, 0), (-60, 0) and (-120, 0) immediately before the earthquake donation. At the same time, companies' accounting-based performance measure, i.e., ROA and Debt assets ratio, did not produce statistically significant effects on the likelihood of donation. Some findings alleviate the concern of reverse causality, namely, firms with better prior stock performance, accounting performances or productivity were more likely to donate and hence displayed the positive impact of donations on abnormal returns.

Based on the probit regression results of **Table A4**, we construct an alternative control group using the propensity score matching method (Kernel matching approach). Specifically, we first estimate the probability of a firm making donations using those determinants in **Table A4**, specifically, the number of years since a firm's listing, debt to assets ratio, return on assets (ROA), TFP, $\ln(\text{sales})$, $\ln(\text{cost})$, $\ln(\text{ongoing projects})$, $\ln(\text{fixed assets})$, $\ln(\text{loan})$ and $\ln(\text{asset})$, industry dummy variables and province dummy variables (see **Appendix Table A5** for the Probit regression results). Then, for each firm in the treatment group, we select a group of firms with similar propensity to donate but did not make donations as its control group (referred to as Control Group 2). As indicated in

² The natural logarithm of sales, and the natural logarithm of assets.

Table 3

Market reactions to corporate donations.

Event Window	(-120 120)		(-60 60)		(-20 20)	
Estimation specification	1	2	1	2	1	2
Dependent variable	Panel A Abnormal return (whole sample)					
Donation indicator _i *Post _{it}	0.002968* (0.001525)	0.002976* (0.001527)	0.002936* (0.001535)	0.002955* (0.001541)	0.002975* (0.00158)	0.00273* (0.001617)
Number of observations	319,800	319,800	147,600	147,600	49,200	49,200
Dependent variable	Panel B Abnormal return (matched sample)					
Donation indicator _i *Post _{it}	0.0035** (0.001)	0.0036** (0.001)	0.0035** (0.001)	0.0036** (0.002)	0.0036** (0.002)	0.0033** (0.002)
Number of observations	280,280	280,280	129,360	129,360	43,120	43,120
Dependent variable	Panel C Abnormal return (with industry clustering)					
Donation indicator _i *Post _{it}	0.0028** (0.001)	0.0028** (0.001)	0.0028** (0.001)	0.0028** (0.001)	0.0028* (0.002)	0.0026* (0.001)
Number of observations	315,900	315,900	145,800	145,800	48,600	48,600
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm time trends	No	Yes	No	Yes	No	Yes

Note: This table analyses the effects of corporate donations on abnormal stock returns. In Panel A, the sample includes all the donor firms (treatment group) and all the non-donor firms (control group), whereas in Panel B, the sample includes the donor firms (treatment group) and the matched control group firms. The matching is carried out through propensity score matching (kernel matching) as shown in Table A5. In Panel C, we conduct the analysis with the industry clustering. Regressions are conducted over three event windows (-20, 20), (-60, 60) and (-120, 120) according to estimation specification (1) as shown in Eq. (1) and specification (2) as shown in Eq. (2), respectively. The dependent variable is the daily abnormal return of company *i* on a trading day *t* in the event window. The key explanatory variable, Donation indicator_i *Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company *i* made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company *i* made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. In addition, estimation specification (2) differs from specification (1) in that the former controls for firm-specific time trends, whereas the latter does not. In Panel A and Panel B, standard errors are clustered at the firm level and reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

Appendix Table A6, the matched groups do not exhibit statistically significant differences in these important firm characteristics, and hence the quality of the matching is good.

Panel B of Table 3 summarizes the results obtained using Control Group 2. Clearly, our main results regarding the positive impact of donation on a firm's abnormal returns remain robust to the use of the matched control group. The magnitude of the impact remains similar. The statistical significance of estimated coefficients is improved in some cases.

Panel C of Table 3 presents the regression results with clustering at the industry level. Firms within the same industry are more likely to exhibit similar stock movements due to shared market conditions and economic factors. As a result, clustering at the industry level allows for the correlation in the error terms for the abnormal returns among firms operating in the same sector, leading to more robust and reliable inference in the analysis. The estimates are similar to those in Panels A of Table 3 in terms of magnitude and statistical significance.

5.2. Robustness checks

In this subsection, we report the results of a series of robustness checks about the donation effect on abnormal returns carried out to address various concerns about our estimation.

First, we exclude from our sample those firms located in the primary quake regions hit hard by the earthquake (Sichuan and Chongqing). The business operation of those firms was likely to be adversely affected by the quake. Meanwhile, owing to their proximity to the site of earthquakes, those firms were more inclined to make donation than firms from those unaffected regions because of social pressures or their moral obligations to local community, but the market reaction to their donations might not be strong as their donations were well anticipated and might not signal much to the market. Having a majority of those firms in the treatment group would under-estimate the impact of donations on abnormal returns. As shown in Panel A of Table A7, our results remain robust to the exclusion of Sichuan and Chongqing-based firms.

Second, we focus our analysis on the sample of firms that made donations, and use those firms that donated later as the control group for those that donated earlier. This can further control for the effects of the unobservable differences in firm attributes between donor and non-donor firms on their stock market performances. As shown in Panel B of Table A7, we find that the daily abnormal return of firms making donation earlier turned out to be on average slightly larger in magnitude than in Table 3 (0.32–0.33 % as opposed to 0.30 % reported in Table 3). Combined with our earlier results in Table 3, the message is that corporate donations helped improve stock market performance, and firms that made donations earlier obtained better market reactions.

Third, we drop those firms which made their first donation beyond two weeks after Wenchuan earthquake from our sample. Since the CCTV philanthropic party held on May 18th (nearly one week after the quake) served as an influential public call for corporate donations from the government, we treat the first two post-quake weeks as the peak period of donation, and donations made after the first two weeks were off-peak ones. Including firms which made their first donation in the off-peak period may contain some potential

problems. On the one hand, as the late donor firms observed that those making donations early enjoyed positive stock market reactions, they might have followed suit as a strategy to boost their market performance. Thus, the inclusion of those firms making donations beyond the first two post-quake weeks may lead to some endogeneity problem. On the other hand, the market might perceive the late donors as reluctant to make quake donations or just pressured to do so, which would contaminate the market's interpretation of corporate quake donations. In our sample, 383 out of 740 firms in the treatment group donated in the first week after Wenchuan earthquake, 224 firms donated in the second week afterwards, and the remaining 133 firms donated beyond two weeks after the earthquake. As shown in Panel C of Table A7, our findings remain robust to the exclusion of those 133 firms that donated more than two weeks after the earthquake, with the magnitude of the impact remaining largely similar. Hence, these two potential problems should not be that serious.³

Fourth, so far in our analysis we use daily stock returns to calculate daily abnormal returns over different time windows. As a robustness check, we follow Lee (1999) and Lee and Mas (2012) to calculate monthly cumulative abnormal returns (namely, the sum of daily abnormal returns in each period of 20 trading days for each firm). The monthly abnormal return is expected to be less volatile than the daily abnormal return. As shown in Panel D of Table A7, the impact of donation on the firm's cumulative abnormal returns remained positive and statistically significant, with the magnitude of the impact being approximately 3.3–3.4 %. In other words, quake donations could generate an average cumulative abnormal return of around 3.3–3.4 % per month for donor firms.

Fifth, thus far, the key independent variable of our analysis is a dummy variable indicating whether a listed firm donated or not. Part of the reason for using this dummy variable is that some of the donations were in-kind ones and were difficult to monetize and compare their value. In our robustness check, we separate our donor firm sample into two subsamples: in-kind donations and cash donations.⁴ For the subsample of cash-donation firms, we use the amount of donation scaled by the firm's operating income as the key independent variable.

Panel A of Table A8 presents the results for the subsample of cash-donation firms where the control group is all the non-donor firms. It is shown that with one percentage point increase in the proportion of donation in the firm's operating income, the daily abnormal return increased by approximately 0.11 % on average. Panel B in Table A8 presents the results for the subsample of in-kind donation firms with all the non-donor firms as control group firms. Surprisingly, in-kind donations had no significant effect at all on abnormal returns. Panel C of Table A8 restricts the analysis to the subsample of donor firms, and compares the market reactions to cash donations with those to in-kind donations. We use an indicator variable of cash donations to distinguish between cash donations and in-kind donations. The results further confirm that cash donations generated a significantly larger market reaction than did in-kind donations. One possible reason is that in-kind donations might signal a shortage of cash holdings of the firm, which canceled out to some degree the positive message of donations to the market. In-kind donations could also suggest a lack of sincerity on the part of donor firms in assisting governments in fulfilling social objectives. For example, firms may have used their inventory of surplus products or surplus intermediate goods as donations. After dropping some sample and control more firm performance variables in Table A9⁵ or A10,⁶ the results are still robust.

Furthermore, we focus on the donations made by non-state-controlled firms in our analysis for several reasons. First, state-controlled firms' decisions on whether to make donations and how much to donate were highly likely a result of government instruction and coordination amid this politicized quake rescue campaign. For instance, Lo (2014) showed that SOEs in China were often under the obligations to donate in the wake of the earthquake, and sometimes the government asked them to contribute to quake relief in other ways such as getting directly involved in quake relief operations, instead of making donations. The employees of SOEs or state-controlled entities also complained that their donations had been extracted under pressure from the Party leaders, and sometimes were even simply deducted from their salaries and wages by fiat (Link, 2008). Second, state-controlled corporations are presumed to be public interest oriented, and donation for improving public image is far less of a concern for them than for non-state-controlled ones. State-controlled corporations were directly administered by governments at various levels so that winning government support was unlikely to be a primary motive for donation. Thus, donor SOEs might not enjoy significant positive market reactions. In Appendix Table A11, we examine the market reactions to quake donations in the subsample of state-controlled listed firms, and find that state-controlled donor listed firms did not generate statistically significantly different market reactions than did state-controlled non-donor listed firms.

³ Additionally, we find that the positive effects of donations on market reaction (in Table A12) and long-term performances (in Table A13) are also primarily evident in companies that donated before May 18.

⁴ Out of 740 firms that made donations, 635 made cash donations while 105 firms had in-kind donations. Among those that made cash donations, the average size of donation was RMB 3.2 million, with the minimum of RMB 1.8 thousand and the maximum of RMB 211 million.

⁵ In Appendix Table A9, Panels A, B and C focus on the subsample excluding firms in the quake regions (Sichuan and Chongqing) with all the remaining non-donor firms as control group firms, the subsample of donor firms (using firms that donated later as control group for the ones that donated earlier), and the subsample dropping those firms that donated beyond two weeks after the occurrence of the quake (with all the remaining non-donor firms as the control group), respectively.

⁶ In Appendix Table A10, we do a robustness check on markets reactions to donation of different sizes, because the amount of cash donation is probable very endogenous to a firm's performance or productivity. Albeit an imperfect solution, we attempt to mitigate this concern by controlling for as many firm performance or productivity measures as possible that include the interactions of a full set of month indicator variables with a firm's initial ROA, initial operating income, initial debt-to-asset ratio, initial operating leverage, initial earnings retention ratio, initial stock ownership share of top five stockholders and initial TFP. In addition, we also include in regressions the interactions of a full set of month dummies with industry and region dummies and firm fixed effects and year fixed effects.

5.3. Donations under china's authoritarian state-guided market economy

The significant positive market reactions to corporate donations can be subject to different interpretations. However, two lines of argument are noteworthy. First is the conventional argument that donations could improve corporate image as a socially responsible firm to the public, and the public, especially consumers, would reward donor firms with more purchases of the firms' products.

Second, corporate donations to the government-favored cause might signal corporations' allegiance and support to governments and bureaucrats, which would help them capture the government and win government support in future business operations. This was especially important for business survival and growth under China's state-guided market economy.

Even after almost five decades of economic reforms, China still keeps a sizable proportion of SOEs in terms of both output and employment, under which non-state-controlled enterprises encounter a series of governments' discriminatory policies against them. How can non-SOEs in the Chinese economy dominated by the influence of the government get back the level playing field? One important way can be for non-state-controlled firms to actively participate in the government-favored causes to help the governments to fulfill their social and political objectives. This will help non-state-controlled firms to signal their political allegiance to the governments and bureaucrats, demonstrate their value and usefulness to the governments, and facilitate them to capture the governments and bureaucrats. Then, the latter will be more likely to treat the former as trustworthy, valuable and reliable businesses that can assist in achieving socioeconomic goals, and consequently reduce or eliminate discriminations against those firms as a reward. Corporate donations to the campaign of quake relief and quake region restructuring are exactly one prominent example of this type of behavior.⁷

In order to distinguish these two types of explanations, we can carry out two types of analysis. Firstly, we carry out a relatively direct test of the first explanation by comparing the market reactions to quake donations made by firms engaged in consumer-oriented (or heavily-polluting) industries with those in non-consumer-oriented (or non-heavily-polluting) industries. If the first explanation holds, we expect to observe stronger market reactions to quake donations in consumer-oriented (or heavily-polluting) industries than in non-consumer-oriented (or non-heavily-polluting) ones. If the second explanation is the main reason, the effect of government influence on business operation was not likely to vary much between consumer and non-consumer-oriented industries and between heavily-polluting and non-heavily-polluting industries.

Secondly, we examine the differences in market reactions to corporate donations and the post-donation firm performances for non-state-controlled donor firms facing different levels of financial constraint, operating in sectors exposed to different levels of government contracting business opportunities, and operating in regions which exhibited different degrees of government control over markets.⁸ If the second explanation is the primary reason, it is reasonable to conjecture that donation would help those firms win government favors and enhance their access to financial resources, government-administered projects and their overall business performances. Thus, financially-constrained firms would be more likely to secure bank loans after donation; companies operating in industries with more likelihood of government contract projects will be able to enhance their business performances; and firms operating in regions where bureaucrats had more discretion on resource allocation would display a more salient effect of donation on firm valuation and performances because bureaucrats could rectify discriminatory treatments and restore equal treatments to the donor firms. If the first explanation is the driving force, however, the effect of donations on corporate image to the public is unlikely to vary much across regions with different government institutional features, and we do not expect to observe significant differences in market reactions to donations by firms operating in different regions.

As a direct test of the first explanation, we conduct regression analysis for the subsample of non-state-controlled firms operating in consumer-oriented industries and the subsample of non-state-controlled firms in non-consumer-oriented industries, respectively. Appendix Table A14 presents the regression results for firms operating in the two types of industries. Clearly, the market reactions to donations in non-consumer-oriented industries were statistically significant and positive. In contrast, the market reactions to quake donations of firms in consumer-oriented industries were negative albeit statistically insignificant. Thus, quake donations did not seem to be a striking instrument of marketing and advertisement.

Appendix Table A15 looks at the market reactions to quake donations made by firms in the group of heavily-polluting industries and the group of non-heavily-polluting industries. Again, the market reactions to donations made by firms in heavily-polluting industries were positive but not statistically significant, whereas quake donations by firms in the other industries aroused statistically significant and positive market reactions. These findings reinforce our conclusion that the fulfillment of corporate social responsibility and the improvement in the public image of donor firms were unlikely to be the dominating factor in driving positive market reactions.

To test the second explanation, we carry out several sets of analysis. First, we use a well-known index of the relationship between the government and the market across regions developed by National Economic Research Institute (NERI) (2007) as a proxy measure of the degree of government intervention. It is built on the basis of the following aspects: the fraction of resources allocated by the market, the tax burden of farmers, government intervention in enterprises, and non-tax fees that enterprises need to pay. We separate regions into two groups, one with lower (below mean) government intervention and the other with higher (above mean) government intervention.

We carry out regression analysis of the donation effect with the non-donor firms as control group in the subsample of regions with lower government intervention and that of regions with higher government intervention separately. As shown in Table 4, we do not find any significant impact of donations on abnormal returns of non-state-controlled donor corporations located in the regions with a

⁷ Earlier studies such as Bai, Lu and Tao (2006) suggest that private firms can have easier access to external finance by making donations.

⁸ Indeed, there are many studies documenting the existence of regional variations in economic institutions and its impacts on firm performance and economic growth (see Du, Lu and Tao, 2014 for a review of their work in this area).

Table 4

Market reactions to quake donations in regions with high and low government intervention.

Event Window	(-120 120)		(-60 60)		(-20 20)	
Estimation specification	1	2	1	2	1	2
Dependent variable	Abnormal return (low government intervention regions)					
Donation indicator _i *Post _{it}	0.002211 (0.00171)	0.002218 (0.00172)	0.002188 (0.00173)	0.002207 (0.00173)	0.00223 (0.00178)	0.00191 (0.00183)
Number of observations	262,340	262,340	121,080	121,080	40,360	40,360
Dependent variable	Abnormal return (high government intervention regions)					
Donation indicator _i *Post _{it}	0.006955** (0.00325)	0.006964** (0.00326)	0.006868** (0.00327)	0.006889** (0.00329)	0.006672** (0.00335)	0.00678** (0.00339)
Number of observations	57,460	57,460	26,520	26,520	8840	8,40
Time fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm time trend	No	Yes	No	Yes	No	Yes

Note: This table shows the heterogeneous effects of corporate donations on abnormal stock returns in different regions: low government intervention regions and high government intervention regions, respectively. We define high (low) government intervention regions as those regions with government intervention index values above (below) the sample median across regions. All regressions are conducted over three event windows (-20, 20), (-60, 60) and (-120, 120) according to estimation specification (1) as shown in Eq. (1) and specification (2) as shown in Eq. (2), respectively. The dependent variable is the daily abnormal return of company *i* on trading day *t* in different event windows. The key explanatory variable, Donation indicator_{*i*} *Post_{*it*}, is an interaction term of Donation indicator_{*i*} (an indicator variable that takes value one if company *i* made quake donation and zero otherwise) and Post_{*it*} (an indicator variable that takes value one in the periods after company *i* made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. In addition, estimation specification (2) differs from specification (1) in that the former controls for firm-specific time trends, whereas the latter does not. Standard errors clustered at the firm level are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

Table 5

Heterogenous market reaction of donor firms in different industries around donation.

Event Window	(-120 120)		(-60 60)		(-20 20)	
Estimation specification	1	2	1	2	1	2
Dependent variable	Panel A Firms in lower level of government-intensity industries					
Donation indicator _i *Post _{it}	0.0021 (0.003)	0.0021 (0.003)	0.0020 (0.004)	0.0020 (0.004)	0.0006 (0.004)	0.0007 (0.004)
Number of observations	47,060	47,060	21,720	21,720	7240	7,40
Dependent variable	Panel B Firms in higher level of government-intensity industries					
Donation indicator _i *Post _{it}	0.0071** (0.003)	0.0071** (0.003)	0.0070** (0.003)	0.0071** (0.003)	0.0072** (0.003)	0.0073** (0.003)
Number of observations	81,120	81,120	37,440	37,440	12,480	12,480
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm time trends	No	Yes	No	Yes	No	Yes

Note: This table analyses the effects of corporate donations on abnormal stock returns. In Panel A, the sample includes firms in lower level of government-intensity industries, whereas in Panel B, the sample includes firms in higher level of government-intensity industries. Method for Measuring Government-Intensity: First, using the 2007 China Input-Output Table, calculate the proportion of each industry's total output allocated to "Public Administration and Social Organizations" (Gov). Second, employ data from the 2008 China Economic Census to obtain specific industry information for each listed company, and match these with the industries in the Input-Output Table to determine the pre-2007 proportion of total output in each industry allocated to "Public Administration and Social Organizations." Third, classify firms into two groups, higher and lower, based on the average Gov value. Regressions are conducted over three event windows (-20, 20), (-60, 60) and (-120, 120) according to estimation specification (1) as shown in Eq. (1) and specification (2) as shown in Eq. (2), respectively. The dependent variable is the daily abnormal return of company *i* on a trading day *t* in the event window. The key explanatory variable, Donation indicator_{*i*} *Post_{*it*}, is an interaction term of Donation indicator_{*i*} (an indicator variable that takes value one if company *i* made quake donation and zero otherwise) and Post_{*it*} (an indicator variable that takes value one in the periods after company *i* made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. In addition, estimation specification (2) differs from specification (1) in that the former controls for firm-specific time trends, whereas the latter does not. Standard errors are clustered at the industry level and are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively. Here we need to note that due to the industry information of listed companies being classified at the GB/T 2-digit level, while the input-output table requires 3-digit industry classification, this study uses data from the 2008 China Economic Census to obtain more detailed industry information for each listed company. However, since the economic census data is based on a sample, the matching process reduced the sample size to 128,180, although the sample remains representative.

Table 6

Heterogenous market reaction of donor firms across firms with varying financial constraints.

Event Window	(-120 120)	(-60 60)	(-20 20)
Estimation specification	1	1	1
Dependent variable	Panel A Firms in lower level of age		
Donation indicator _i *Post _{it}	0.0006** (0.000)	0.0006 (0.001)	-0.0004 (0.001)
Number of observations	155,556	71,632	24,436
Dependent variable	Panel B Firms in higher level of age		
Donation indicator _i *Post _{it}	0.0008 (0.001)	0.0002 (0.001)	-0.0005 (0.002)
Number of observations	144,855	66,066	22,755
Dependent variable	Panel C Firms in lower level of dividend payout ratio		
Donation indicator _i *Post _{it}	0.0007** (0.000)	0.0006 (0.001)	-0.0004 (0.001)
Number of observations	206,712	95,227	32,472
Dependent variable	Panel D Firms in higher level of dividend payout ratio		
Donation indicator _i *Post _{it}	0.0000 (0.000)	-0.0001 (0.000)	-0.0001 (0.001)
Number of observations	93,177	42,471	14,637
Time fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes

Note: This table analyses the effects of corporate donations on abnormal stock returns. In Panel A, the sample includes firms in lower level of age, whereas in Panel B, the sample includes firms in higher level of age. In Panel C, the sample includes firms in lower level of dividend payout ratio, whereas in Panel D, the sample includes firms in higher level of dividend payout ratio. Old_i is grouped based on the 2007 median age, with old_i set to 1 if above the median, and 0 otherwise. low dividend payout ratio_i is classified based on each firm's 2007 dividend payout ratio, with a value of 1 if it is above the average. The regressions control for firm fixed effects, year fixed effects and region times year fixed effects. Regressions are conducted over three event windows (-20, 20), (-60, 60) and (-120, 120) according to estimation specification (1) as shown in Eq. (1). The dependent variable is the daily abnormal return of company *i* on a trading day *t* in the event window. The key explanatory variable, Donation indicator_i *Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company *i* made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company *i* made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. Standard errors are clustered at the industry level and are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

lower degree of government intervention, compared with the non-state-controlled non-donor firms in these regions.⁹ In stark contrast, non-state-controlled donor corporations in the regions with higher government interventions enjoyed a significant daily average premium in abnormal returns of approximately 0.7 % in the post-donation period.

Second, we investigate how the market responded to the donation by firms in sectors with high and low government contract intensities. Following Berger et al (2013), we calculate industry-level government contract intensity in China and classify firms into two groups, i.e., the high government intensity group and the low government intensity group. In Table 5, we find that the significant and positive stock market reaction to corporate donation appears only in the subsample of high-government-intensity industries. This demonstrates that investors value those donor corporations operating in industries with a high prior likelihood of obtaining government contracts as donation would likely bring government favor and government-administered projects to them. This lends further support to the view that corporations made donations to win governments' favorable treatment. This also suggests that the elevation of public image in the eyes of the public after donation was unlikely the dominant force.

Third, we explore how market reactions varied with the firm-level financial constraint faced by corporate donors. Under the politically-discriminatory financial system in China, non-state-controlled corporates typically face more severe constraint in gaining access to external finance from the formal financial system than do state-controlled companies. Donation is therefore expected to be beneficial to those non-state-controlled companies facing more serious financial constraint as the government would help them access external finance. Following Cloyne et al. (2023), we employ firm age and dividend payout ratio as proxy measures of financial constraint. Mature companies and high-dividend-payout-ratio firms face less financial constraint than young firms and low-dividend-payout-ratio ones. In Table 6, we conduct regression analysis in each subsample. It is observed that the market gave a premium to young donor companies in the window of (-120, 120), while there is no such premium for mature companies. Moreover, the market reaction to donation by low-dividend-payout firms was significant and positive for the windows of (-120, 120), whilst the market was not excited with donation by high-dividend-paying firms. This result gives some support to the claim that the investing public expected those more financially-constrained firms to gain better access to external finance and valued their donation more favorably.

In summary, we find that only in regions with heavier government intervention, sectors with high government intensity and corporates with serious financial constraint did non-state-controlled corporations enjoy significant positive market reactions to their

⁹ In Table A16, we examine the market reactions to in-kind donations of firms in different provinces, and observe that firms with in-kind donations operating in regions with higher government intervention displayed significantly higher abnormal returns in all the event windows, i.e., (-20, +20), (-60, +60), (-120, +120).

donations after the Wenchuan earthquake. These striking results suggest that the expected benefits of gaining level playing fields were likely to be the primary force behind positive market reactions.

One case is a family-controlled firm, Tianjin Rongcheng United Iron and Steel Group Company Limited.¹⁰ The boss, Mr. Zhang Xiangqing, is a native of Tangshan. In the tragic Tangshan earthquake in 1976, he himself survived but lost his parents. In the 1990s, he and his wife gradually built up a business and developed it into one major private enterprise in Tianjin. In the wake of the Wenchuan earthquake, the couple first donated 30 million yuan. They were picked by the Tianjin government to be recommended to participate in the CCTV donation party held on May 18, 2008. On the site, they decided to raise the amount of donation to 100 million yuan. His action caught a great deal of public attention because this orphan of Tangshan earthquake made a generous donation to the Wenchuan earthquake victims out of his sympathy and similar painful experiences in the past. The then party chief of Tianjin municipality, Mr. Zhang Gaoli, expressed appreciation of his generosity on behalf of Tianjin government and Tianjin people. Following the donation, Mr. Zhang's company received quite a few awards and quite much government support. For instance, the company was designated as a model large-scale enterprise by the Ministry of Industry and Information Technology, and received financial support from the Ministry of Finance in 2009. The company's steel products were designated as famous-brand products of Tianjin municipality in 2009. The frequency and the level of the government awards, certification, and support the company received after the earthquake were undoubtedly considerably higher than in the pre-quake period. This helped the company regain a level playing field, and it has become the largest privately-owned firm in Tianjin.

It is noteworthy that the finding on the stronger market reactions for firms that donated within two weeks after the quake also reinforces our main argument. Donations of non-state-controlled firms served as a signal of political allegiance. Those firms that donated earlier demonstrated stronger initiatives and activeness in helping governments and bureaucrats fulfill their social objectives, which could be more appreciated by government officials and would reap more benefits from retrieving a level playing field.

5.4. How did donations affect firms' performances?

In this subsection, we try to understand how donations brought about benefits to non-state-controlled firms and thus allowed them to enjoy abnormal returns after making donations. To answer this question, in Table 7, we investigate whether donor firms experienced improvements in their performances over the period of 2005–2011, i.e., three years before and after the quake and corporate donation, which could then justify the positive stock market reactions to their donations.

We first look at several broad indicators of firm performances, i.e., total sales, total costs and the ratio of total sales to total costs. Total sales and total costs can provide information on the scale of business operations. More specifically, an increase in total sales of a donor firm can stem from the fact that consumers welcome the donor firm's products. It can also result from more favorable treatments from governments as, for example, they are granted more government procurement contracts or obtain more external finance. We use the ratio of total sales to total costs as a proxy for firm profitability, mainly because profit figures are typically subject to various accounting and tax adjustments and firms may purposely distort profit figures for tax evasion reasons.

We then proceed with the DID analysis. As shown in Table 7, those non-state-controlled donor corporations, compared with those non-state-controlled non-donor firms, enjoyed a 42 % increase in sales, 22 % increase in total costs, and 18 % increase in the log ratio of sales to costs.

We further explore the underlying factors that contributed to the improvement in donor firm performances. Because of data limitations, we focus on several variables for which data are available and can potentially shed light on the importance of government-business relationship in shaping corporate performances. First, bank loans. Provided it is widely documented that privately-owned firms are discriminated against in gaining access to loans from the predominantly state-controlled banking system, this is probably the most striking indicator of how well the non-state-controlled donor firms are treated in this key factor market compared with their non-donor counterparts. An increase in the size of bank loans obtained may well reflect that donor firms were successful in retrieving a level playing field to some degree. Second, the size of ongoing projects. An increase in the size of ongoing projects largely indicates getting new business opportunities and achieving business expansion, and part of this expansion may come from receiving government procurement contracts. The other two variables are fixed assets and total assets. An increase in fixed assets and/or total assets can also reflect business expansion to a large extent. In this sense, these two variables can complement the size of ongoing projects in partially capturing the opportunities of business expansion and public procurement contracts in the post-donation period.

As shown in Table 7, underlying the increase in sales, those non-state-controlled firms enjoyed a considerable increase of 67 % in the total amount of loans, experienced a substantial increase (78 %) in the size of ongoing projects, and registered an impressive increase in assets (41 % increase in total fixed assets and 19 % increase in total assets) relative to their non-donor counterparts.

To ensure the validity of the DID analysis, in Table 8, we first analyze the pre-treatment trends of firms' performances. The result show that there are no significant differences before the earthquake in some performance variables, such as sales, costs, sales/costs, total assets, fixed assets, and projects in progress, between donor firms and their control firms in the pre-donation period. These tests largely lend support to the common pre-trend hypothesis for the donor firms and the control group firms.

To understand better the role of government-business relationship in shaping donor firm performances, we further examine the effects of donation on the performances of non-state-controlled firms operating in regions with different degrees of government intervention in the regional economy, in sectors with different government intensities, and firms facing different degrees of financial

¹⁰ This case is based on the information contained in several news reports published by Chinese official media and introductions to the company.

Table 7

Analysis of firms' long-term performance around donation.

Column VARIABLES	1 Lnsales	2 Lncosts	3 Ln(sales/costs)	4 Lnloans	5 Ln(ongoing projects)	6 Ln(fixed assets)	7 Lnassets
Donation indicator _i *Post _{it}	0.4162*** (0.106)	0.2215*** (0.048)	0.1821** (0.071)	0.6743** (0.305)	0.7814*** (0.296)	0.4122*** (0.103)	0.1910*** (0.053)
Observations	9286	9,79	9,75	9,58	9,99	9,92	9,92
Firm dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows the effects of corporate donations on long-term firm performances (2005–2011), i.e., three years before and after quake donations. The analysis is conducted for the whole sample. The dependent variables are total sales, total costs, the ratio of total sales to total costs, loan amount (sum of long and short term loans), value of ongoing projects, fixed assets, and total assets, in columns (1)–(7), respectively, all of which are in the logarithm form. These variables are all from firms' annual financial statements. The key explanatory variable, Donation indicator_i *Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company i made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company i made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. Standard errors clustered at the firm level are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

Table 8

Difference in performances between donor and non-donor firms before the earthquake.

Column Dependent variable	1 Ln(sales)	2 Ln(costs)	3 Ln(sales/costs)	4 Ln(loans)	5 Ln(ongoing projects)	6 Ln(fixed assets)	7 Ln(assets)
Donation indicator _i *Post2007 _{it}	0.0663 (0.051)	0.0293 (0.035)	0.0198 (0.029)	0.0262 (0.332)	-0.4395 (0.367)	0.0786 (0.058)	0.0360 (0.023)
Donation indicator _i *Post2006 _{it}	0.0446 (0.035)	0.0266 (0.021)	0.0097 (0.025)	0.3385 (0.274)	-0.1827 (0.319)	0.0370 (0.032)	*0.0315** (0.013)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	3524	3,21	3,18	3,18	3,23	3,28	3,28

Note: This table shows us the difference in performances between donor firms and non-donor firms before donation or before earthquake. The sample is restricted to 2005–2007. The key explanatory variable, Donation indicator_i *Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company i made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after year 2006 or year 2007). The regressions control for the interactions of a full set of year dummies with the firm's initial ROA, initial operating income, initial debt asset ratio, initial operating leverage, initial earning retention ratio, initial share of top 5 stockholder and the initial TFP, and firm fixed effects and year fixed effects. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

Table 9

Analysis of firms' long-term performance around donation in high and low government intervention regions.

Column VARIABLES Sample	1 Lnsales	2 Lncosts	3 Ln(sales/costs)	4 Lnloans	5 Ln(ongoing projects)	6 Ln(fixed assets)	7 Lnassets
Panel A Firms in low government intervention regions							
Donation indicator _i *Post _{it}	0.3680*** (0.129)	0.2254*** (0.060)	0.1270 0.086	0.5038 (0.386)	0.4481 (0.388)	0.3591*** (0.118)	0.2023*** (0.073)
Observations	5849	5,45	5,43	5,33	5,66	5,53	5,53
Panel B Firms in high government intervention regions							
Donation indicator _i *Post _{it}	0.4831*** (0.179)	0.2189*** (0.080)	0.2536** 0.118	0.9002* (0.487)	1.3080*** (0.461)	0.4850*** (0.186)	0.2189*** (0.080)
Observations	3437	3,34	3,32	3,25	3,33	3,39	3,34
Firm dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows the effects of corporate donations on long-term firm performances (2005–2011), i.e., three years before and after quake donations. In Panels A and B, we look at the heterogeneous effects of donations on firm performances in low-government-intervention regions and high-government-intervention regions, respectively. The dependent variables are total sales, total costs, the ratio of total sales to total costs, loan amount (sum of long- and short-term loans), value of ongoing projects, fixed assets, and total assets, in columns (1)–(7), respectively, all of which are in the logarithm form. These variables are all from firms' annual financial statements. The key explanatory variable, Donation indicator_i *Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company i made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company i made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. Standard errors clustered at the firm level are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

Table 10

Analysis of firms' long-term performance in different industries around donation.

Column VARIABLES Sample	1 Lnsales	2 Lncosts	3 Ln(sales/costs)	4 Lnloans	5 Ln(ongoing projects)	6 Ln(fixed assets)	7 Lnassets
Panel A Firms in lower level of government-intensity industries							
Donation indicator _i * Post _{it}	0.1289** (0.061)	0.0879 (0.055)	0.0308 (0.026)	-0.5598 (0.498)	0.3219 (0.449)	0.1713* (0.087)	0.1126** (0.054)
Observations	3278	3,77	3,77	3,64	3,74	3,78	3,78
Panel B Firms in higher level of government-intensity industries							
Donation indicator _i * Post _{it}	0.5522*** (0.154)	0.2860*** (0.066)	0.2534** (0.104)	1.2601*** (0.377)	1.0257*** (0.384)	0.5227*** (0.146)	0.2271*** (0.074)
Observations	6008	6,02	5,98	5,94	5,25	6,14	6,14
Firm dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows us the heterogeneous effects of corporate donations on long-term performances in different industries: industries with lower level of government-intensity and industries with higher level of government-intensity, respectively. The key explanatory variable is Donation indicator, which takes value one if a company made quake donation and zero otherwise. The regressions control for region fixed effects and year fixed effects. Standard errors are clustered at the firm level and are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

Table 11

Heterogeneous Effects of Corporate Donations on firm performance Across Firms with Varying Financial Constraints.

Column Dependent variable	1 Lnsales	2 Lncosts	3 Ln(sales/ costs)	4 Lnloans	5 Ln(short term loan)	6 Ln(long term loan)	7 Ln(ongoing projects)	8 Ln(fixed assets)	9 Lnassets
Panel A use firm age to measure financial constraint									
indicator _i * Post _{it}	0.2099** (0.097)	0.0688 (0.052)	0.1345** (0.060)	0.3429 (0.217)	0.3269 (0.250)	0.2167 (0.528)	0.3795 (0.272)	0.1393* (0.079)	0.0821 (0.052)
indicator _i * Post _{it} * (1-old _i)	0.1949*** (0.048)	0.1870*** (0.038)	0.0076 (0.024)	0.3925* (0.224)	0.4588* (0.259)	0.1975 (0.522)	0.6408*** (0.229)	0.2830*** (0.048)	0.1113*** (0.036)
Observations	8551	8,45	8,42	8,11	8,58	8,08	8,42	8,55	8,55
Panel B use dividend payouts to measure financial constraint									
indicator _i * Post _{it}	0.0991* (0.051)	0.0920* (0.052)	0.0072 (0.011)	-0.3599 (0.482)	-0.4719 (0.550)	-0.9521 (0.709)	0.1988 (0.359)	0.2156*** (0.076)	0.0782* (0.041)
indicator _i * Post _{it} * low dividend payout ratio _i	0.2332* (0.123)	0.0515 (0.080)	0.1715** (0.071)	1.0049* (0.600)	1.1395* (0.668)	1.7231** (0.778)	0.5060 (0.424)	-0.0238 (0.118)	0.0172 (0.065)
Observations	8551	8,45	8,42	8,11	8,58	8,08	8,42	8,55	8,55
Firm dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES

Note: This table shows the analysis of the heterogeneous effects of corporate donations on long-term firm performances (2005–2011) for different donor firms with different financial constraint. Following Cloyne et al. (2024), we use firm age (in 2007) and dividend payouts (dividend payout ratio, defined as dividends per share/earnings per share) to measure financial constraint. The dependent variables are total sales, total costs, total sales to total costs, loan amount (sum of long and short term loans), short term loan, long term loan, value of ongoing projects, fixed assets, and total assets in columns (1)–(9), respectively, all of which are in the logarithm form. These variables are all from firms' annual financial statements. The key explanatory variable, Donation indicator_i * Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company i made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company i made donation and zero otherwise). Furthermore, we include in the model the interaction terms of Donation indicator_i * Post_{it} with (1-old_i) (in Panel A) or low dividend payout ratio_i (in Panel B). old_i is grouped based on the 2007 median age, with old_i set to 1 if above the median, and 0 otherwise. low dividend payout ratio_i is classified based on each firm's 2007 dividend payout ratio, with a value of 1 if it is above the average. The regressions control for firm fixed effects, year fixed effects and region times year fixed effects. Standard errors clustered at the firm level are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

constraint.

First, Table 9 show how quake donations affected the performances of non-state-controlled corporations operating in regions with lower government intervention and higher government intervention, respectively. While donor companies in both types of regions experienced statistically significant increases in the sales, costs, fixed assets and total assets, those donor corporations located in regions with a higher degree of government intervention displayed statistically significant increases in the sales to cost ratio, bank loans

and the size of ongoing projects.¹¹

Second, we examine whether the elevated prospects of winning government contract projects would help improve the performances of those companies operating in high-government-intensity sectors more than their counterparts in low-government-intensity sectors. Table 10, Panels A and B, present regression results of how quake donations affected the performances of non-state-controlled corporations operating in low-government-intensity sectors and in high-government-intensity sectors, respectively. Strikingly, the donor firms engaged in high-government-intensity industries delivered significantly better performances in all the metrics than their non-donor control firms. Although the donor firms in low-government-intensity industries produced significantly larger increments in sales, fixed assets and total assets than their non-donor control firms, the strength of donor firms was not salient as that in the high-government-intensity sectors. These results suggest that companies in high-government-intensity sectors might probably have obtained benefits of government contracting opportunities that helped improve their performances.

Third, we compare the post-donation performances of companies with a high and low level of financial constraint. Using firm age and dividend-payout ratio as proxy metrics of firm-level financial constraint, we find in Table 11 that younger firms produced better performances in sales, bank loans, short-term loans, ongoing projects, fixed assets and total assets. Similarly, low-dividend-payout firms achieved better performances in sales, sales-to-costs ratio, bank loans, short-term loans and long-term loans.

Taken together, our analysis shows that, by making donations, non-state-controlled listed firms were able to enjoy faster business expansion and higher profits (a result of much more increases in sales than in costs), which explain the significant positive market reactions they enjoyed from donation. More importantly, by comparing the performance changes of non-state-controlled donor firms in regions with different intensities of government intervention, in sectors with different government intensities, and firms facing different degrees of financial constraint, our results suggest that non-state enterprises were able to redress the discriminations they faced in both the input market (e.g., more bank loans) and the output market (e.g., more sales) through corporate donation. Consistently, such redress of discrimination was more pronounced in regions where bureaucrats had more discretionary power. The results also suggest that larger sales as a result of better corporate image of donor firms to the public was probably not the primary reason for the stronger corporate performance of donor firms.

5.5. Efficiency implications of quake donations

As discussed above, given that quake donations could help redress the non-level playing field for non-state-controlled firms in the product and factor markets, we believe quake donations would generally enhance the efficiency of resource allocation between the state sector and the non-state sector. A further intriguing question is whether the quake donation campaign and the subsequent government responses achieved the efficiency of resource allocation among those non-state-controlled donor firms.

First, if the quake donation was entirely market-based and the donor firms were motivated by the benefits of fulfilling corporate social responsibility mainly reflected in larger consumer demand for their products, it would generate a beneficial cycle: firms which expected to benefit more from quake donation would make a larger amount of donation, and would obtain larger benefits after donation. Our analysis has shown that this scenario was not the driving force behind the quake donation tournament in China.

Second, in the government-orchestrated donation campaign under China's authoritarian state-guided market economy, if the more *ex ante* efficient non-state-controlled firms were more active in making donation and also obtained larger benefits subsequently, the donation campaign could be regarded as having improved the efficiency of resource allocation among non-state-controlled firms. As discussed above, this scenario is consistent with one potential mechanism for non-state firms to capture the government, that is, to demonstrate their growth potential and their ability to help the local government raise GDP growth and tax revenue and fulfill its social obligations. Conversely, if the less *ex ante* efficient non-state-controlled firms donated more, and registered a larger subsequent gain, then donation campaign was largely a bribery competition, which was less efficient in resource allocation than in the preceding scenario. This is also consistent with one potential scenario of corporate capture of the government discussed above, that is, non-state firms conduct bribery and intense rent-seeking to capture the government and bureaucrats. Nonetheless, as long as donations could help these non-state-controlled firms retrieve a level playing field, the donation campaign still achieved a moderate efficiency improvement relative to the original situation where these non-state-controlled firms were highly discriminated against in product and factor markets.

We use the cross-firm median value of average ROA in the pre-donation period (2005–07) to divide the sample of non-state-controlled firms into two groups: the *ex ante* high-efficiency firms (with above-median ROA) and the *ex ante* low-efficiency firms (with below-median ROA). In Appendix Table A19, Columns 1–2, we conduct regression analysis to examine whether the *ex ante* high-efficiency firms made larger-sized donations (adjusted by the mean operating income in 2005–07) than did the *ex ante* low-efficiency firms. We do not find any statistically significant difference in donation size between the two groups of donor firms. In Columns (3)–(4), we add the cross term between the indicator of high government intervention regions and the high-efficiency donor firm dummy. It does not produce statistically significant estimated coefficient. This suggests that even in high-government-intervention regions high-efficiency firms did not seem to be particularly active in making donations in order to subsequently obtain more resources for corporate development. At the same time, the low-efficiency firms did not seem to make disproportionately large efforts to join the donation tournament for the purpose of bribery or excessive rent-seeking, either.

One possible explanation is that high-efficiency non-state firms could capture the government by their growth potential and their

¹¹ After restricting the sample to the matched sample (in Table A17) or conducting the panel GMM estimation using lagged regressors as instrumental variables (in Table A18), the results remain robust.

Table 12

Analysis of high-efficiency and low-efficiency firms' market reactions to donations.

Column	1	2	3	4	5	6	7	8
Estimation Specification	1	2	1	2	1	2	1	2
VARIABLES	High efficiency firms				Low efficiency firms			
	High government intervention regions		Low government intervention regions		High government intervention regions		Low government intervention regions	
Donation indicator _i *Post _{it}	0.0032 (0.003)	0.0032 (0.003)	0.0016 (0.003)	0.0016 (0.003)	0.0053* (0.003)	0.0054* (0.003)	0.0006 (0.004)	0.0006 (0.004)
Observations	78,780	78,780	67,340	67,340	115,180	115,180	58,500	58,500
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Time Trend	No	Yes	No	Yes	No	Yes	No	Yes

Note: This table shows the heterogeneous effects of corporate donations on abnormal stock returns for high efficiency firms and low efficiency firms in low government intervention regions and high government intervention regions in columns (1)–(4) and columns (5)–(8), respectively. We define high (low) government intervention regions as those regions with government intervention index values above (below) the sample median across regions. All regressions are conducted over three event windows (–20, 20), (–60, 60) and (–120, 120) according to estimation specification (1) as shown in Eq. (1) and specification (2) as shown in Eq. (2). The dependent variable is the daily abnormal return of company *i* on trading day *t* in different event windows. The key explanatory variable, Donation Indicator_i *Post_{it}, is an interaction term of Donation Indicator_i (an indicator variable that takes value one if company *i* made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company *i* made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. In addition, estimation specification (2) differs from specification (1) in that the former controls for firm-specific time trends, whereas the latter does not. Standard errors clustered at the firm level are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

Table 13

Analysis of high-efficiency and low-efficiency firms' performances around donation in regions with high and low government intervention.

Column	1	2	3	4	5	6	7
VARIABLES	Insales	Incost	ln(sales/cost)	Lnloan	ln(ongoing projects)	ln(fixed assets)	lnasset
Panel A: High efficiency firms in high government intervention regions							
Donation indicator _i *Post _{it}	-0.0374 (0.228)	-0.0358 (0.095)	-0.0057 (0.159)	-0.3061 (0.629)	0.4365 (0.439)	-0.0330 (0.139)	-0.1725 (0.140)
Observations	2098	2,94	2,94	2,81	2,95	2,98	2,98
Panel B: High efficiency firms in low government intervention regions							
Donation indicator _i *Post _{it}	0.4380** (0.213)	0.1963** (0.082)	0.1940 (0.148)	-0.1930 (0.672)	0.0339 (0.633)	0.2132 (0.152)	0.2255*** (0.078)
Observations	2398	2,95	2,95	2,57	2,74	2,99	2,99
Panel C: Low efficiency firms in high government intervention regions							
Donation indicator _i *Post _{it}	0.5237*** (0.183)	0.2797*** (0.087)	0.2418** (0.118)	0.9479* (0.498)	0.7692 (0.573)	0.5128** (0.209)	0.1632* (0.089)
Observations	2816	2,15	2,13	2,14	2,13	2,18	2,18
Panel D: Low efficiency firms in low government intervention regions							
Donation indicator _i *Post _{it}	0.4090* (0.223)	0.1535 (0.104)	0.2482 (0.151)	0.5457 (0.612)	0.8459 (0.654)	0.3496 (0.231)	0.2285** (0.111)
Observations	1974	1,75	1,73	1,06	1,17	1,77	1,77
Firm dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows the analysis of the heterogeneous effects of corporate donations on long-term firm performances (2005–2011) in four panels. In Panels A and B, we look at the heterogeneous effects of the quake donations of high-efficiency firms on firm performances in high government intervention regions and low government intervention regions, respectively. In Panels C and D, we look at the heterogeneous effects of the quake donations of low-efficiency firms on firm performances in high government intervention regions and low government intervention regions, respectively. The dependent variables are total sales, total costs, total sales to total costs, loan amount (sum of long and short term loans), value of ongoing projects, fixed assets, and total assets in columns (1)–(7), respectively, all of which are in the logarithm form. These variables are all from firms' annual financial statements. The key explanatory variable, Donation indicator_i *Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company *i* made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company *i* made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. Standard errors clustered at the firm level are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

importance to local economic growth. They might not allocate too many resources to quake donations. Meanwhile, China is different from many other former socialist countries. The objective of local governments and bureaucrats is still largely growth and development-oriented. Consequently, low-efficiency firms might not find it particularly rewarding to put in too many resources for quake donation either.

In Table 12, we present the market reactions to corporate donations by high-efficiency firms and low-efficiency firms, relative to their control group firms, in regions with a high and low degree of government intervention separately. Only the group of low-

efficiency firms in regions with a high degree of government intervention displayed a positive and significant market reaction to their donations.

We further examine the changes in the operation performance indicators of high-efficiency donor firms, relative to their control group firms, in regions with a high degree and a low degree of government intervention in Table 13, Panels A and B, respectively. These high-efficiency firms produced a significant improvement in sales, costs and total assets, relative to their control group firms, in the low-government-intervention region in the post-donation period.

Table 13, Panels C and D, present the DID regression results of the effect of quake donations on performance changes of low-efficiency donor firms, relative to their control group firms, in regions with a high degree and low degree of government intervention, respectively. In contrast with the high-efficiency donor firms, low-efficiency firms produced significant increases in all performance indicators except ongoing projects in the high-government-intervention regions. Moreover, low-efficiency firms in regions with lower government intervention produced significant increases in total sales and total assets. Thus, low-efficiency firms in regions with a high degree of government intervention delivered a striking improvement in firm performance.¹²

These findings generally convey several messages. First, *ex ante* low-efficiency firms displayed a more salient improvement in accessing resources than *ex ante* high-efficiency firms, although the former did not make a larger-size donation than did the latter. This suggests the government-orchestrated quake donation was not consistent with the principle of an efficient donation tournament.

Second, the more striking improvement for low-efficiency firms in access to resources and operational performance could stem from the fact that these firms were much more disadvantaged in resource allocation in the pre-donation period; consequently, the rectification of discrimination in product and input markets in the post-donation period helped produce a more salient effect on the performance of these low-efficiency firms. In Appendix Table A21, we compare some firm-level attributes of high-efficiency and low-efficiency firms. We find that high-efficiency firms were typically more recently listed, had a larger equity size (*Total Equity*) and ownership concentration (*Squared Sum of Ownership Proportions of Block Shareholders*), had a larger state ownership share, and had a larger mean level of operating income in the pre-donation period. Thus, low-efficiency firms were operating at a smaller scale, had a lower level of state ownership and government protection, and were probably more disadvantaged in product and factor markets. Thus, the post-donation improvement would be more striking for the low-efficiency firms.

5.6. A comparison with bribery competition

One potential concern is that the quake donation campaign could be primarily a competition for bribery or intense rent seeking. Bureaucratic corruption might aggravate discrimination against privately-controlled enterprises as discriminatory regulations forced or induced private entrepreneurs to bribe bureaucrats in order to obtain permits for business operation, which created a private market for bureaucrats to sell their political power and contributed to the non-level playing field for privately-controlled enterprises.¹³

If bribery contest was the main underlying force, we expect to observe that firms in high-corruption regions displayed a more striking improvement in gaining access to resources and a more salient rise in firm performances. Furthermore, low-efficiency firms were expected to be more keen to bribe bureaucrats through donation, and they would produce the most striking improvement in securing resources and raising firm performances in high-corruption regions.

To examine the relevance of donation as a bribery competition, we construct a corruption index using the information obtained from the Survey of China's Private Enterprises dataset.¹⁴ Specifically, it is the proportion of private entrepreneurs in a region answering "Yes" to a question concerning whether it is necessary for the region to have stricter policies against government corruption, with a higher value of this variable (denoted by *Government Corruption*) indicating a higher level of bureaucratic corruption. We define all those regions with the value of corruption index higher than the national mean value as higher-corruption regions, and the remainder as the lower-corruption regions, and repeat our analysis for these groups of regions separately.

To check whether the corruption index and the government intervention index capture distinct dimensions of government institution quality, we conduct a simple regression of the government intervention index on the corruption index across 31 provinces in China, and find that they are negative and statistically insignificantly correlated. This helps confirm that the two indices address different aspects of regional government institutions.

We first check whether low-efficiency firms in high-corruption regions made disproportionately large donations as a bribe contest. In Appendix Table A22, we do not find that high-efficiency donor firms and low-efficiency donor firms exhibited significant differences in donation size in high-corruption regions. Thus, there is no sign that low-efficiency firms more actively participated in bribery tournament.

Next, we investigate the changes in access to resources and firm performances for donor firms in high- and low-corruption regions. Table 14, Panels A and B, look at the changes in the performance indicators of non-state-controlled firms operating in regions with a lower and a higher degree of corruption, respectively. Donor firms in both types of regions displayed a significant increase in sales, costs, the ratio of sales to costs, fixed assets and total assets. Donor companies in lower-corruption regions displayed a significant increase in the size of ongoing projects, but those in higher-corruption regions displayed a significant increase in bank loans. Thus, there was no striking difference in the changes in access to resources and firm performances between donor firms in higher corruption

¹² Appendix Table A20 carries out GMM regression analysis and confirms this pattern of results.

¹³ Indeed, there are a lot of studies documenting the existence of regional variations in economic institutions and its impacts on firm performance and economic growth (see Du et al., 2014 for a review of their work in this area).

¹⁴ For more details about this survey data, please see, for example, Li, Meng, Wang, and Zhou (2008), and Du, Lu and Tao (2014).

Table 14

Analysis of firms' long-term performance around donation in high and low corruption regions.

Column VARIABLES	1 lnsales	2 lncost	3 ln(sales/cost)	4 lnloan	5 ln(ongoing projects)	6 ln(fixed asset)	7 lnasset
Sample	Panel A Firms in high corruption regions						
Donation Indicator _i *Post _{it}	0.4803*** (0.178)	0.2634*** (0.073)	0.2152* (0.120)	0.8975* (0.514)	0.0187 (0.471)	0.4397*** (0.138)	0.2494*** (0.088)
Observations	3830	3,28	3826	3731	3,47	3,33	3,33
Sample	Panel B Firms in low corruption regions						
Donation Indicator _i *Post _{it}	0.3730*** (0.131)	0.1937*** (0.064)	0.1596* (0.087)	0.5162 (0.376)	1.2787*** (0.380)	0.3932*** (0.144)	0.1529** (0.065)
Observations	5456	5,51	5,49	5,27	5,52	5,59	5,59
Sample	Panel C: High efficiency firms in high corruption regions						
Donation Indicator _i *Post _{it}	0.1991 (0.254)	0.1040 (0.103)	0.1001 (0.180)	0.4068 (0.724)	0.3104 (0.563)	0.1320 (0.132)	0.0819 (0.120)
Observations	2412	2,09	2,09	2,72	2,86	2,13	2,13
Sample	Panel D: High efficiency firms in low corruption regions						
Donation Indicator _i *Post _{it}	0.1689 (0.200)	0.0477 (0.081)	0.0743 (0.136)	-0.8306 (0.580)	0.2139 (0.503)	0.0325 (0.152)	-0.0525 (0.117)
Observations	2084	2,80	2,80	2,66	2,83	2,84	2,84
Sample	Panel E: Low efficiency firms in high corruption regions						
Donation Indicator _i *Post _{it}	0.5274** (0.226)	0.1868* (0.096)	0.3387** (0.155)	0.2535 (0.607)	-0.5945 (0.650)	0.2090 (0.199)	0.1537 (0.106)
Observations	2394	2,97	2,93	2,31	2,35	2,99	2,99
Sample	Panel F: Low efficiency firms in low corruption regions						
Donation Indicator _i *Post _{it}	0.4125** (0.179)	0.2464** (0.095)	0.1589 (0.113)	1.2980*** (0.495)	2.0378*** (0.569)	0.6427*** (0.229)	0.2167** (0.087)
Observations	2396	2,93	2,93	2,89	2,95	2,96	2,96
Firm dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows the analysis of the heterogeneous effects of corporate donations on the long-term firm performances (2005–2011) in six panels. In Panels A and B, we look at the heterogeneous effects of corporate donation on firm performances in the whole sample in high corruption regions and low corruption regions, respectively. In Panels C and D, we look at the heterogeneous effects of donations on the performances of high efficiency firms in high government intervention regions and low government intervention regions, respectively. In Panels E and F, we look at the heterogeneous effects of quake donations on the performances of low efficiency firms in high government intervention regions and low government intervention regions, respectively. The dependent variables are total sales, total costs, total sales to total costs, loan amount (sum of long and short term loans), value of ongoing projects, fixed assets, and total assets, respectively, all of which are in the logarithm form. These variables are all from firms' annual financial statements. The key explanatory variable, Donation indicator_i *Post_{it}, is an interaction term of Donation indicator_i (an indicator variable that takes value one if company *i* made quake donation and zero otherwise) and Post_{it} (an indicator variable that takes value one in the periods after company *i* made donation and zero otherwise). The regressions control for firm fixed effects and year fixed effects. Standard errors are clustered at the firm level and are reported in the brackets. Superscripts *, **, *** represent statistical significance at the 10 %, 5 %, and 1 % level, respectively.

regions and those in lower corruption regions.¹⁵

We continue to check the changes in corporate performance of high-efficiency donor firms, in comparison with their control group firms, in regions with a high degree and a low degree of bureaucratic corruption in Table 14 Panels C and D, respectively. The high-efficiency firms did not produce a significant improvement in all these performance indicators, relative to their control group firms, in either type of regions in the post-donation period.

In Table 14, Panels E and F, we look at the performance changes for low-efficiency donor firms, relative to their control group firms, in regions with a high degree and low degree of corruption, respectively. It is observed that low-efficiency firms in high-corruption regions delivered a larger increase in sales, a smaller increase in costs, and hence a larger increase in the sales/costs ratio than low-efficiency firms in low-corruption regions, relative to their respective control firms. Nevertheless, low-efficiency firms in low-corruption regions produced significant increases in all the performance indicators except the sales/costs ratio. Hence, low-efficiency firms did not produce a particularly striking change in access to resources or performances in high-corruption regions, which is inconsistent with the bribery competition thesis for quake donations.¹⁶

Our analysis demonstrates the role of corporate donation as an instrument of government-business cooperation. To some extent, corporate donations bear some resemblance to bribery in that they fulfill the same goal of achieving the cooperation between bureaucrats and entrepreneurs. In corruption, entrepreneurs pay bribes to government officials to form a collusion so as to win business permits or licenses, receive loans, and secure government procurement and projects. Nonetheless, they are fundamentally different in several key features. Firstly, corporate donations contribute to the capacity of governments in the provision of public goods, whereas bribes only benefit some specific corrupted officials. Secondly, bribes target specific bureaucrats so that the reward scheme to bribe-

¹⁵ In Table A23, after restricting the sample to the matched sample (in Panels A and B) or conducting the panel GMM estimation using lagged regressors as instrumental variables (in Panels C and D), the results remain robust.

¹⁶ In Appendix Table A24, we employ GMM model to examine this issue. The results are consistent with the findings in Table 14, Panels C-F

paying entrepreneurs largely hinges on that the bribe-taking government officials remain in power. When bribe-taking bureaucrats move to work in other areas or supervise other industries, the entrepreneurs will need to go along with these bureaucrats and explore business opportunities in these new areas or industries, or bribe new bureaucrats in their existing areas/industries. In contrast, corporate donations help non-state-controlled firms and entrepreneurs to win trust from the whole government rather than specific bureaucrats, which is likely to generate a more long-lasting, more institutionalized and more stable relationship between donor firms and the government. Thirdly, the illegality and secrecy of bribery encourage corrupted officials to give undue weight to those business lines that are easy for them to grab bribes and keep their misconduct secret, e.g., infrastructure projects. To keep bribe-taking secret, corrupted officials will also keep the number of entrepreneurs that they collude with as small as possible; consequently, they would discourage new business entry and competition, and discourage growth and innovation (Shleifer and Vishny, 1993). In contrast, corporate donation is an apparently legal and legitimate activity, which is consistent with the world trend of growing awareness of corporate social responsibility. Thus, corporate donation involves much less inefficiency and distortion in resource allocation than does bribery. It is true that bribery becomes a major means of captor firms to achieve state capture, influence the government and bureaucrats, and seek rents in the process of economic transition in some former socialist countries with a weak state apparatus. The strong government and the primarily developmental state in China make corruption a less significant instrument for non-state firms to capture the government.

5.7. A comparison with corporate political contributions

This study is also related to the literature on corporate political contributions in both developed countries and emerging market economies. In the U.S. and some other mature Western democracies, corporate political or campaign contributions facilitate corporations to gain access to politicians and buy influence from them. Political elections can be conceptualized as a competitive market for private benefits, and firms or other special interests can make campaign contributions to curry favor with politicians (see, for example, Grossman and Helpman, 2001). It is expected that elected officials may propose grants and procurement contracts that can directly benefit the contributing company, or vote or pressure for favorable changes in legislation or regulation which can indirectly benefit the contributing firm. The empirical findings on whether corporate contributions buy political favors remain mixed (Ansolabehere, et al., 2003; Fowler, et al., 2017; Bertrand et al., 2020). In emerging market economies, campaign contributions are also likely to help firms establish or strengthen political connections and gain favorable treatments. For example, Claessens et al. (2008) find that Brazilian firms that provided contributions to elected federal deputies in the 1998 and 2002 elections experienced higher stock returns and substantially increased their bank financing.

Although there is no meaningful political competition through elections in China's authoritarian regime, it is likely that corporate donations to disaster relief can help bureaucrats to fulfill their political objectives of achieving an efficient disaster rescue campaign and indirectly enhance the chances of these bureaucrats of keeping their official positions or getting promotion in bureaucratic hierarchy. In this sense, corporate donations to quake relief campaign might become the *de facto* corporate political contributions that indirectly help government officials in political competition and enable the donor firms to curry favor with bureaucrats.

Nonetheless, it is important to point out that corporate donations to disaster relief in the context of China's authoritarian state-guided market economy are fundamentally different from corporate political or campaign contributions in democracies such as the U.S.

Firstly, corporate campaign contributions target specific political candidates running for elections. In contrast, corporate donations to disaster rescue efforts in China enable firms to share the financial burden of disaster relief with the government, especially the local government, and help the whole government apparatus to realize the goal of delivering a fast and efficient rescue campaign, which in turn helps enhance the legitimacy of the regime. Although it is likely that disaster donations can ingratiate the donor company with some specific government officials, what is more important is that the donor firm demonstrates its loyalty to and cooperativeness with the whole government system so that the government's removal of unfair treatments of the donor company would not hinge primarily on these specific officials. In this sense, corporate disaster relief donations help donor firms to gain access to the government system and to be treated as reliable and trustworthy friends of the government.¹⁷

Secondly, the leveling of the playing fields received by the donor firms is not equivalent to the fruits of rent seeking through campaign contribution. Under China's state-guided market economy, SOEs are invariably treated much better than do non-SOEs in general and thus usually enjoy rents from their privileged status in the economy. Corporate donations can help non-SOE donor firms to partially rectify the unlevel-playing field between SOEs and non-SOEs, but they do not seek and obtain additional benefits on top of what SOEs have. Moreover, the non-SOE donors typically made good use of the improved treatments in the product and factor markets and produced superior performances. This is in contrast to rent-seeking firms making campaign contributions. As shown in Claessens et al. (2008), those Brazilian firms that made campaign contributions to elected federal deputies obtained more bank loans but performed poorly, which involves efficiency losses. On the contrary, the non-SOE donor firms in our study delivered better performances after overcoming some obstacles in the product and factor markets, which contains less allocation inefficiency.

¹⁷ Actually, in the context of China's state-guided market economy, the efforts of entrepreneurs or corporations to cultivate connections to government officials are typically specific to certain bureaucrats and bear more resemblances to campaign contributions in mature democracies.

6. Conclusion

This study employs event study approach to document a strong positive market reaction to non-state-controlled listed firms that made donations to the relief campaign of Wenchuan earthquake in China in 2008, and the positive market responses were driven by companies operating in regions with a higher degree of bureaucratic discretion reflected in more government intervention. The long-term post-donation firm performance changes were consistent with the favorable market reactions. Our findings suggest that non-state-controlled firms probably used quake donations, which assisted governments in fulfilling the political goal of quake relief, as an instrument to capture the state by proving their value to the government in assisting the fulfillment of government objectives, win the trust of bureaucrats and get back a level playing field under an authoritarian state-guided market economy model. In this sense, corporate donations or corporate social responsibility activities can serve as an instrument of government-business cooperation.

As civil society is repressed to a large extent in China's authoritarian regime, corporate donations in response to the call of the government for some major public events can fill in the void left by the weakness of the sector of non-government organizations and enhance social welfare to some degree. Nevertheless, this type of corporate social responsibility activity may ignore many aspects that are directly beneficial to citizens but are of less concern to the government. For example, environmental protection was for a long time a less serious concern than GDP growth for local bureaucrats so that many corporations did not pay enough attention to it. Furthermore, given the nature of corporate donation as an instrument of reciprocal exchanges of favors between entrepreneurs and bureaucrats, firm donations under state-guided market economy could deter the development of a fair business environment built upon rule of law, and impede the establishment of a level playing field for both state-controlled and non-state-controlled enterprises. In this sense, a return of corporate donation to its original meaning as a fulfillment of corporate social responsibility is called for.

CRedit authorship contribution statement

Julan Du: Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Yi Lu:** Investigation, Formal analysis, Data curation. **Zhigang Tao:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Yan Zhang:** Resources, Investigation, Formal analysis, Data curation.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jce.2025.03.004](https://doi.org/10.1016/j.jce.2025.03.004).

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