Implicit corruption with subsidiaries: Evidence from land sales in China

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Abstract

This paper presents evidence that politically connected firms hide their political favors through subsidiaries. Specifically, while the headquarters of connected listed firms pay land prices comparable to other firms, their subsidiaries pay 12.1-13.2% less. The discount is exacerbated when the land is sold through supply methods that lack informational transparency and in regions that are susceptible to corruption. Moreover, larger charitable donations are followed by greater price discounts for connected subsidiaries, suggesting a reciprocal relationship between connected firms and government officials. Further difference-in-difference results show that the price distortions were mostly driven by corruption and were rectified by the anti-corruption campaign, while government subsidies became the major determinant afterward.

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1. Introduction

It is an open secret that political resources can be translated into pecuniary benefits (e.g., Acemoglu and Verdier, 2000; Fisman, 2001). The literature has well-documented evidence that politically connected firms receive favorable treatment from the government, financial institutions, and other investors (see, e.g., Boubakri et al., 2012; Claessens et al., 2008; Faccio et al., 2006; Feng et al., 2015; Goldman et al., 2009; Khwaja and Mian, 2005). The phenomenon that political connections can facilitate blurred financial benefits is widespread, even for the countries that scored high in the Corruption Perception Index released by Transparency International.[1]

On the other hand, firms with direct political connections are also subject to public monitoring and regulatory scrutiny. As a result, recent studies (Broadstock et al., 2020; Chen and Kung, 2019) unveil that firms are able to gain more competitive advantages when they build indirect political connections through social networks (i.e., building links with politically connected individuals and with relatives of top political elites, respectively) than direct political connections (i.e., directly recruiting politically connected individuals). However, this cannot explain the reason why firms are enthusiastic about building direct political connections (Faccio, 2006; Li et al., 2007; Szakonyi, 2018) rather than only relying on indirect ones, and investors also respond positively to direct political connections (Child et al., 2021; Goldman et al., 2009; Schoenherr, 2019).

[1] Transparency International is a non-government organization that oversees the corruption situations and accountability of the governments of 174 countries. Its definition of political corruption is not limited to only financial benefits or political finance but also includes other forms, such as vote-buying. The Corruption Perception Index ranges between 0 (highly corrupt) and 100 (corruption-free). Denmark, Finland, and New Zealand are tied for the least corrupt government in 2021, with index values of 88, indicating some politically connected corruption still exists. See https://www.transparency.org/en/about for more details.

This study adds to the literature on political connections by describing a new mechanism of how directly connected firms hide their political benefits. Specially, using the unique institutional setting in China's land market, we show that directly politically connected firms use subsidiaries to hide land price discounts they can obtain from local officials.

China's primary land market is well suited to test the impact of political connections.[2] Even though local authorities have been required to sell all land parcels for business use through auctions since 2004 and disclose all land transaction data since August 2006, they continue to hold some discretionary power to alter land prices (e.g., Cai et al., 2013). The National Audit Office reports that, between 2008 and 2013, local authorities have under-collected land transfer revenue of RMB 366.4 billion (USD 51.3 billion, or 2.7% of total land transfer revenue during the audit period) and additionally exempted or refunded the land transfer revenue of RMB 721.8 billion (USD 101.1 billion, or 5.4% of total revenue).[3] As land transfer revenue is one major resource to finance fiscal expenditures of local governments and has amplified effects on the real economy, the impact of land transfer revenue losses on the real economy is larger than the recorded amount (e.g., Su, 2022).

Given that firms have discretionary power over subsidiary information disclosure (e.g., Dyreng et al., 2020), they could potentially utilize subsidiaries to hide unethical and even illegal behaviors, including pollution-intensive activities (Lee and Bansal, 2024), tax avoidance (Dyreng et al., 2013) and shareholder expropriation (O'Donovan et al., 2019).

[2] According to Transparency International, China was ranked 66 in 2021 with a corruption perception index value of 45, ranked together with Romania, for example. It ranked 78 the previous year, with a corruption perception index value of 42.

[3] "*Report of the State Council on the audit review of central budgets and other fiscal revenue and expenditure in* 2014" published by National Audit Office on June 28, 2015. See https://www.audit.gov.cn/n5/n26/c67491/content.html (in Chinese) for more details.

Because of the availability of high-quality land transaction data, we are able to distinguish between land parcels purchased by headquarters and by subsidiaries of politically connected listed firms. This allows us to extend this strand of literature by investigating whether politically connected firms use subsidiaries to hide their political favors.

In addition, the anti-corruption campaign launched in late 2012 can serve as a natural experiment that effectively curbs the willingness of local officials to provide favorable treatments to politically connected firms (e.g., Chen and Kung, 2019; Hao et al., 2020; Zhang, 2023). In this case, if Chinese politically connected firms indeed use subsidiaries to conceal their politically favorable treatments, we expect the anti-corruption campaign significantly reduce the land price differences between subsidiaries and headquarters of connected firms. Otherwise, the impact of the anti-corruption campaign is insignificant.

To mitigate unobserved heterogeneities between the treatment and control groups, we follow the spatial matching approach proposed by Chen and Kung (2019), and match each land transaction made by politically connected listed firms with nearby recent land transactions made by other firms. As land transactions conducted by the treated and control groups share similar transaction times and locations, our results are immune from firms' potential bias in choosing subsidiary location (Chen et al, 2020) and investment location (Nian and Wang, 2023) to build political connections, or by information advantage held of politically connected firms (Wang and Yang, 2021).

Our empirical results indicate that Chinese politically connected firms receive political favors in the primary land market and use their subsidiaries to hide these preferential treatments. Specifically, while headquarters of the politically connected listed firms pay comparable land prices, their subsidiaries enjoyed larger price discounts when

acquiring commercial land and residential land (16.5-18.9% and 18.5-25.1%, respectively), more than triple that for industrial land (5.3-5.6%). Similar evidence cannot be found from subsidiaries of politically unconnected firms. This result provides preliminary evidence that the price discount obtained by subsidiaries is modestly driven by corruption rather than government subsidies, since existing literature commonly attributes industrial land price discount to government land subsidies, (e.g., Liu and Xiong, 2020; Tu et al., 2014) while residential land price discount to corruption (e.g., Cai et al., 2013; Cai et al., 2017). Besides, the result that the land price discount is exacerbated when the land parcel is sold through informationally opaque supply methods (i.e., negotiations and two-stage auctions) is also consistent with the corruption explanation.

Notably, the difference-in-difference results further establish the causal relationship by showing that the anti-corruption campaign since late 2012 has effectively mitigated the price discount obtained by subsidiaries of politically connected firms. More interestingly, the land price discount moves closely with the strength of the anti-corruption campaign. It was minimized in 2017 when the strength of the anti-corruption campaign peaked, and reemerged thereafter, albeit moderately, when anti-corruption was less vigorous. Moreover, further results show that the anti-corruption campaign has only rectified the land price discount for commercial and residential land parcels but not for industrial land parcels. This suggests that the anti-corruption campaign has alleviated most of land price distortions but cannot correct price distortions due to government subsidies.

Using charitable donation expenses as an alternative measure of political connection, we find that firms have used charitable donations in exchange for lower land purchase prices through their subsidiaries and cover these political favors by increasing purchase

price through their headquarters. This reciprocal relationship has been eliminated after the anti-corruption campaign, aligning with the findings of Hao et al. (2020). While, we also find a negative relationship between government subsidies and land purchase prices paid by subsidiaries, which has doubled in strength after the anti-corruption campaign. This corroborates our DiD findings that anti-corruption campaign has mitigated land price distortions caused by corruption but cannot rectify price distortions due to government subsidies.

Our heterogeneous analysis also supports the main results that corruption is the major factor contributing to land price distortions. Price discounts are only significant for subsidiaries of private firms but not for state-owned enterprises (SOEs), which contrasts previous studies (e.g., Cong et al., 2019) that government stimulus packages disproportionately favor SOEs. Land price discounts are also larger in regions with higher potential for corruption (i.e., regions with weaker legal protection environments and less developed private sectors). Finally, firm-level results show that politically connected firms have deliberately extracted rent by disproportionally purchasing more land parcels through their subsidiaries before the anti-corruption campaign, and this rent-seeking behavior has also been terminated by the campaign. Our main results are robust to different model specifications, matching approaches, and 2SLS estimation.

To our best knowledge, this study is the first to illustrate how politically connected firms hide their political favors through subsidiaries. Our main contributions are twofold. First, we identify a new form of implicit political connection (through the use of subsidiaries) and suggest several possible remedies, including increasing transparency of the transaction, legal protection, and private sector development. Second, we reveal the

mechanism of which firms hide the benefits derived from their political connections, thereby extending the literature on political connections (e.g., Boubakri et al., 2012; Faccio, 2006; Schweizer et al., 2019), on land price distortions (e.g., Cai et al., 2013; Tu et al., 2014; Wang and Yang, 2021), and on the impact of government interventions on firm behavior (e.g., Chen et al., 2020; Fan et al., 2007). Our study distinguishes from those of Chen and Kung (2019) and Wang and Yang (2021) in that our aim is to investigate how politically connected firms hide their political favors, rather than quantifying the impact of different political favors. Moreover, the ownership structure between headquarters and subsidiaries allows connected firms to directly reap the benefits of favorable treatment, which is distinct to the well-studied social network (e.g., Child et al., 2021; Haselmann et al., 2018; Schoenherr, 2019). Therefore, our analysis prompts a broader discussion on whether and how political benefits can be hide through inter- and intra-organizational networks, in addition to the social networks of top executives.

The remainder of the paper proceeds as follows. Section 2 reviews the institutional background and develops the hypotheses. Section 3 presents our data, sample, and variable definitions. Section 4 reports the results of empirical analyses, and Section 5 concludes.

2. Institutional background, and hypotheses development

2.1 Background of China's primary land market

Ownership of urban land in China is retained by the State, while the land use rights can be transferred between private investors after the amendment of the Constitution in 1988 (see, for example, Qin et al., 2016). Henceforth, we use "sell land parcels" or "sell land" to denote "sell the land use rights of land parcels" for brevity. In the 1990s to early

2000s, the Chinese primary land market gradually transferred from a planned market to an open market. However, administration allocation (*huabo*) — the non-market-oriented land sales method inherited from the planned economy era — still constituted 41.4% of the total urban land supply area in 2001 (Qian, 2008). Negotiation (*xieyi*) was the most used market-oriented land sales method in the early 2000s, and was also the most informally opaque method (Cai et al., 2013). The "hidden" price negotiation process enabled government officials to abuse their discretionary power to extract private benefits leading to corruption.

Consequently, the Central Commission for Discipline Inspection set up provisions to combat land-related corruption in 2004[4]. The Ministry of Land and Resources also requires the provincial land bureaus to dispose of all land for business use, such as commerce, tourism, entertainment, and commodity housing, through a transparent auction-based land sales system (i.e., sealed bid auctions (*zhaobiao*), two-stage auctions (*guapai*) or English auctions (*paimai*)).[5] Figure 1 shows that land parcels sold through negotiation have declined from 61.87% in 2007 to 33.71% in 2020. At the same time, two-stage auctions have become the primary land sales method (53.93% of the total land transactions and 73.62% of the total area of land supply in 2020).

Even though the most used two-stage auctions are more transparent than negotiation and administrative allocation, they still cannot solve the problem of land-related corruption.

[4] "*Notice of the Disciplinary Supervision Department of the Central Commission for Discipline Inspection about punishments on abuse of authority to extract private benefits by intervening in the bidding and tendering process of construction projects, land transfers and real estate development and operation, and other related market economic activities*," issued by the Central Commission for Discipline Inspection on February 3, 2004. See https://zzb.fzu.edu.cn/info/1031/1733.htm (in Chinese) for more details.

[5] Decree No. 11 of the Ministry of Land and Resources, titled "*Provisions on the assignment of the state-owned land use rights by means of sealed bid auctions, two-stage auctions or English auctions*" was issued on May 9, 2002. See http://www.gov.cn/gongbao/content/2003/content_62586.htm (in Chinese) for more details.

For example, Cai et al. (2013) argue that two-stage auctions could be manipulated and are associated with corruption, because favored bidders in the first stage can signal that the auctions have been "taken", discouraging subsequent potential entrants, leading to lower land prices (around 17% lower than English auctions). Wang and Yang (2021) also find a price discount for two-stage auctions, and Cai et al. (2017) suggest that real estate developers are more likely to exceed the floor-to-area ratio limit if they acquire land parcels through two-stage auctions. Another piece of evidence of land-related corruption comes from princeling firms purchasing land parcels at below-market prices (Chen and Kung, 2019). Province-level officials who have provided the price discount to princeling firms are more likely to be promoted to national leadership positions.

The corruption case of the former vice mayor of Hangzhou (one of the top ten cities in China based on GDP and size), Maiyong Xu, is a typical example of how local authorities extract personal benefits through the land market. Maiyong Xu himself was an owner and major investor of several real estate developers and has benefited from favorable land prices since 1995. He also granted land use rights to his distant cousin and other firms with discount prices in exchange for pecuniary benefits. Up to 2009, he accumulated a total wealth of RMB 198 million (i.e., USD 27.7 million) through land-related corruption.[6]

In addition to pecuniary benefits, local officials also have incentives to intervene in the primary land market because of the GDP-based evaluation and promotion system. For example, local officials are motivated to attract manufacturing investments by suppressing

[6] "*A typical example of the abuse of political power in land market*" published by Xinhua News Agency (the official state news agency of China) on May 13, 2011. See http://www.gov.cn/jrzg/2011-05/13/content_1863788.htm (in Chinese) for more details.

industrial land prices (Liu and Xiong, 2020) and negotiating land prices with industry firms (Tu et al., 2014), which in turn promote local economic growth, tax revenue, and employment (Tao et al., 2010). Wang and Hui (2017) provide empirical evidence that city-level officials deliberately intervene in the primary land market to make a balance between collecting enough land revenue and curbing housing prices.

2.2 Hypotheses development

The literature on political connections has well documented that connected firms, especially connected private firms, receive more favorable treatment than other firms. For example, politically connected firms have better access to bank credit in Pakistan (Khwaja and Mian, 2005), Brazil (Claessens et al., 2008), and China (Wang, 2015). In addition, connected firms, on average, have lower costs of capital (Boubakri et al., 2012), higher probabilities of IPO approval (Liu et al., 2013), better access to government bailouts (Faccio et al., 2006) and regulated industries (Feng et al., 2015), and hence have higher market valuations (Goldman et al., 2009). However, firms might want to avoid being seen as favorably treated, especially in countries like China where politicians are sensitive to favoritism. A solution is to have the firm's subsidiary with less obvious political connections exploit the benefit.

In this paper, we look at the possible discounts from the detailed information about every land auction that is publicly available. This contrasts the relatively opaque and difficult-to-quantify favorable treatments in previous studies, such as credit granting process (e.g., Khwaja and Mian, 2005), the IPO approval process (e.g., Liu et al., 2013), and the process of issuing permits for regulated industries (Feng et al., 2015). The Chinese

primary land market is under regulatory scrutiny by the Central Commission for Discipline Inspection and the media. Therefore, local officials are less likely to provide land price discounts to firms with direct political ties. Wang and Yang (2021) finds that, Chinese state-owned enterprises (SOEs) on average pay 9.5-11.9% more than private firms when acquiring land parcels. On the contrary, firms with implicit political ties through linking to family members of a handful of political elites sitting on the Politburo and its Standing Committee (a.k.a. princeling firms) enjoy a 55.4% land price discount (Chen and Kung, 2019). Broadstock et al. (2020) also shows that implicit political connections through recruiting colleagues of government officials bring more benefits than explicit political connections by recruiting former government officials.

We use headquarter-subsidiary relationships as an identification of explicit and implicit political connections. Firms can strategically manage subsidiary disclosures, even basic location information (Dyreng et al., 2020), leading to a relatively opaque information environment for firm subsidiaries. Therefore, we consider the headquarters of politically connected listed firms as explicitly, and their subsidiaries as implicitly, politically connected firms. We expect that firms with implicit political ties can extract rent better, and therefore develop the following hypothesis:

H1: *Politically connected firms pay less when they purchase land parcels through their subsidiaries than through their headquarters*.

In addition, the discretionary power of local government officials in the primary land market is the premise of firms' rent-seeking behavior. For example, land parcels disposed of through relatively opaque negotiation sales and two-stage auctions methods are constantly lower than through English auctions (e.g., Cai et al., 2013; Qin et al., 2016;

Wang and Yang, 2021). Because land price manipulation is positively correlated with the opacity of land sales methods, connected firms can gain a competitive advantage if the market price can be manipulated rather than entirely determined by competition. We therefore formulate the second hypothesis as follows:

H2: *Subsidiaries of politically connected firms purchase land parcels at discount when they are disposed of through informationally opaque sales methods.*

We also investigate the two potential reasons for the linkage between land prices and political connections, being GDP-based promotion and corruption. As mentioned earlier, local governors tend to grant industrial land at subsidized prices in order to boost production for the hope of GDP-based promotion. Cheap land for other purposes would most likely be due to corruption, and therefore vanishes after anti-corruption campaign. We thus have the following two hypotheses:

H3a (Government subsidy hypothesis): *The price discount obtained by subsidiaries of politically connected firms is larger for subsidized industrial land parcels than those for other land use*.

H3b (Corruption hypothesis): *The price discount obtained by subsidiaries of politically connected firms has been significantly reduced after the anti-corruption campaign*.

3. Sample, measurements, and descriptive statistics

Our sample is initially composed of all land transactions between January 2007 and August 2020. We started in 2007 because local authorities have been required to disclose land transaction information on the China Land Market website (www.landchina.com)

since August 2006.[7] To maintain a clean treatment sample, we exclude land parcels purchased by individuals because their identities are opaque (Wang and Yang, 2021). We also exclude land parcels purchased by public institutions and government agencies (such as local municipal government, local courts, local education bureau, etc.) and sold through administrative allocation because they are mainly used for public services and cannot be directly transferred between investors (Tan et al., 2011). We delete land parcels sold through administrative allocation and land parcels with a zero-transaction price. Our final sample consists of 904,476 land transactions. The average land price of the selected observations is significantly more expensive than that of excluded observations (2,058.43 versus 1,188.69 *yuan* or CNY per square meter, 1 *yuan* ≈ 0.15 USD). The average land size of the selected observations is also larger (34,601.91 versus 32,193.71 square meters).

The financial information, subsidiary names, and executives' resume of listed firms are obtained from China Stock Market & Accounting Research (CSMAR) database. Following Fan et al. (2007), Cao et al. (2017), and Wang and Wu (2020), we define a listed firm as politically connected if one or more of its CEOs or board chairpersons is/are (was/were) a county head or higher-level government official, member of the People's Congress (CPC), or member of the People's Political Consultative Conference (CPPCC). To investigate whether politically connected firms could purchase land parcels at a discount through their headquarters and their subsidiaries separately, we match land transaction data and firm-level data by firm (subsidiary) name following the procedure in Tan et al. (2020)

[7] "*Detailed rules on the assignment of land use rights by means of sealed bid auctions, two-stage auctions or English auctions* (*Trail Implementation*)" issued by the Ministry of Land and Resources on May 31, 2006. See http://www.mnr.gov.cn/gk/tzgg/201207/t20120723_1989380.html (in Chinese) for more details.

and Arora et al. (2021). The detailed matching procedure is explained in Appendix A. We use subsidiaries to denote both subsidiaries and branches for brevity.

Another critical challenge is that the price differences between land transactions could be affected not only by political connections and observed control variables, but also by unobserved local economic conditions. A way to alleviate this issue is to consider land transactions made by politically connected listed firms as the treatment group and use nearby recent land transactions as the control group to mitigate unobserved heterogeneities between the treatment and control groups. We therefore adopt the spatial matching approach proposed by Chen and Kung (2019) from which, by assuming that land parcels within the same area have similar quality and hence similar selling prices if sold in the same year, we match each land parcel purchased by politically connected listed firms (including subsidiaries) with land parcels purchased in the same year and within a 1,500-meter radius (about eight blocks). We also use a more restrictive 500-meter radius (about three blocks) as robustness checks.

The summary statistics of land parcels in Panel A of Table 1 show that the average land cost for politically connected firms is 2,605.464 *yuan* per square meter and is 27.44% (2,605.464 / 2,044.499 − 1) higher than that for other firms (2,044.499 *yuan* per square). Meanwhile, the dispersion of land cost for politically connected firms is around 1.92% (9,845.661 / 512,688.927) of that for other firms, indicating the existence of significant heterogeneity in the control group (i.e., other firms). By matching all land transaction observations in the treatment group with comparable observations in the control group, we are able to reduce the dispersion of land cost for the control group by 98.49% (7,738.050 /

512,688.927 – 1) as shown in Panel B. Note that the treatment group (politically connected listed firms) is identical for both the full sample and all other different matched samples.

As exhibited in Panel C, the average land cost for politically connected listed firms is lower than that for unlisted firms but higher than that for unconnected listed firms. We are not able to identify whether an unlisted firm is a politically connected firm because such data are unavailable. Second, Panel B also shows that politically connected firms are more likely to acquire larger land parcels (48,856.851 versus 38,170.560 square meters) and with better quality (4.869 versus 5.019) and commercial land (34.0% versus 21.1% of total land parcels).[8] Third, politically connected firms have purchased 93.1% of land parcels through their subsidiaries (reflected by the indirect land purchase identifier, *Subsidiary*). Similarly, other listed firms with no political connections have purchased 90.91% (0.030/0.033) of land parcels through their subsidiaries.[9]

Table 2 shows that politically connected listed firms (treated firms) constitute 18.63% of total land buyers in the matched sample (within a 1,500-meter radius). Note that 9,520 of the 9,863 politically connected listed firms are subsidiaries. This highlights the crucial role of subsidiaries in land transactions. Among listed land buyers, the sectoral distribution of politically connected land buyers is similar to that of unconnected land buyers, as shown in Panel B of Table 2. The top two origins of listed firms are the manufacturing industry (30.47% and 37.48% of politically connected and unconnected listed land buyers,

[8] Land parcel quality, *Quality*, is a subjective measure evaluated by the office-in-charge. We include it as a categorial control variable as in Chen and Kung (2021).

[9] Within the matched sample (as shown in Panel B of Table 1), politically unconnected listed firms in total have purchased 2,395 (3.3% × 72,585) land parcels, among which 2,178 (3.0% × 72,585) land parcels are purchased through their subsidiaries. Because of data limitations, we could only identify subsidiaries of listed firms.

respectively) and the real estate industry (22.36% and 27.05%). The sectoral distribution of unlisted land buyers is more concentrated than that of listed land buyers. Around two-thirds of unlisted land buyers are either manufacturing firms (41.97%) or real estate firms (25.89%).

4. Methodologies and empirical results

4.1 Price discounts obtained by subsidiaries of politically connected firms

We first follow the empirical framework of Chen and Kung (2019) to investigate whether politically connected firms can purchase land parcels at a discount, especially when they use their subsidiaries in the bidding process. The baseline regression model is specified as:

$$Price_{i,b,j,s,t} = \beta_0 + \beta_1 Connected_{b,t} + \beta_2 Connected_{b,t} \times Subsidiary_{b,t} + \gamma X_{i,t} + \omega_{s,t} + \varphi_{j,t} + v_{i,b,j,s,t} \quad (1)$$

where $Price_{i,b,j,s,t}$ denotes the natural logarithm of the price (*yuan* per square meter) for land parcel *i* purchased by land buyer *b* in city *j* for usage *s* in year *t*. Recall that the six land usage types are residential land, commercial land, industrial land, infrastructure land, public services land, and other land (as described in Appendix B).[10] $Connected_{b,t}$ equals 1 if the firm *b* or the headquarter of firm *b* is a politically connected firm, and 0 otherwise. $Subsidiary_{b,t}$ equals 1 if firm *b* is a subsidiary or a local branch of a listed firm, and 0 otherwise. Because politically connected and unconnected listed firms tend to purchase

[10] The group of other usage types includes public services land (0.99% of the matched sample), infrastructure land (4.59% of the matched sample), and other lands (0.01% of the matched sample). Public services and infrastructure land can be influenced by unobserved macroeconomic factors, such as social security concerns, and only comprise around 5% of the sample. Therefore, we have not reported the regression results for the group of other usage types.

land parcels at different locations, connected subsidiaries account for 90.4% of land transactions purchased by subsidiaries in the spatial matched sample (1,500-meter radius). As a result, *Subsidiary* and *Connected* × *Subsidiary* are highly correlated (correlation coefficient of 0.9358) in the matched sample. We therefore drop the variable, *Subsidiary*, in main regressions to avoid the multicollinearity problem. We add a robustness test in Section 4.7 on whether unconnected subsidiaries also acquire land parcels at discount prices by including land parcels purchased by both connected and unconnected subsidiaries as the treatment group.

As discussed before, we consider headquarters/subsidiaries of politically connected firms as firms with explicit/implicit political ties. β_1 therefore captures the average land price discount due to explicit political ties, and $\beta_1 + \beta_2$ for implicit ties. The interacting term $Connected_{b,t} \times Subsidiary_{b,t}$ is the key independent variable in this study as β_2 reflects the impact difference between implicit and explicit political ties. $X_{i,t}$ is a vector of transaction-level control variables, including the log of land size (square meters), land quality dummies, land sales method dummies, firm size, firm ownership, firm listed status, and industry dummies (See Appendix B for detailed definitions for all variables). Moreover, we include city-year fixed effects ($\varphi_{j,t}$), usage-year fixed effects ($\omega_{s,t}$), and month fixed effects to absorb land price discounts/premiums due to unobserved factors, such as land price heterogeneity across city and across year, local government subsidies (e.g., Tao et al., 2010), the turnover of local officials (e.g., Shen et al., 2022), and the use of land finance (e.g., Han et al., 2015). Standard errors are adjusted for the firm and province-level clusters unless otherwise specified.

Table 3 reports the baseline regression results (with control variable details omitted). Column 1 shows that politically connected firms, in aggregate, could not obtain a statistically significant land price discount (the coefficient of *Connected* is negative but insignificant). However, when we further differentiate between land parcels purchased by headquarters and by subsidiaries of politically listed firms in column 2, the coefficient of *Connected* becomes positively significant (0.097). This suggests that the headquarters of the politically connected firm actually pay a 9.7% premium over comparable land transactions. On the other hand, subsidiaries of politically connected firms pay 12.8% less than their headquarters (the coefficient of *Connected* × *Subsidiary* equals 0.128), although they do not have a significant price advantage over comparable transactions (coefficient of *Connected* + Coef. of *Connected* × *Subsidiary* is insignificant at 10% level based on the Wald test).

Note however that politically connected firms can afford to purchase higher quality land parcels closer to city centers because they have better access to bank credit (see Wang, 2015) and equity capital (see Liu et al., 2013). This selection bias can lead to biased estimates in Columns 1 and 2 of Table 3. To mitigate this concern, we repeat Equation (1) on matched samples and report the results in columns 3 and 4. As expected, the coefficients of *Connected* become smaller in magnitude and insignificant. In contrast, the sum of coefficients of *Connected* and *Connected* × *Subsidiary* becomes larger in magnitude and negatively significant (see Wald tests, coefficient of *Connected* + coefficient of *Connected* × *Subsidiary* equals –0.132 and –0.121 for 1,500-meter radius and 500-meter radius matched samples, respectively). In other words, the baseline regression results support our hypothesis H1 that politically connected firms pay similar land prices to other firms when

purchasing land parcels through their headquarters, but enjoy a 12.1-13.2% (0.014+0.107 and 0.019+0.113 respectively) price discount when purchasing land parcels through their subsidiaries. Finally, in columns 5 and 6 of Table 3, we re-estimate Equation (1) by including alternative fixed effects, controlling for the city, year, and usage fixed effects and not controlling for fixed effects, respectively. Results are consistent.

The results of control variables (as reported in Appendix C) are mostly consistent with previous studies (e.g., Chow and Ooi, 2014; Gilje and Taillard, 2016; Wang and Yang, 2021). Land size is negatively associated with land price. Public firms facing less asymmetric information and financial constraints can afford more capital-intensive investment opportunities and purchase more expensive land parcels. Regarding different land sales methods, two-stage auctions result in lower land prices than English auctions. Similarly, the average land price in sealed bid auctions is also lower than that in English auctions based on matched samples (in columns 3 and 4 in Appendix C). Consistent with the previous finding that local governments tend to lure manufacturing investments with low industrial land prices, manufacturing companies as major land buyers (30.47% of total politically connected land buyers as in Panel B of Table 2) acquire land parcels at discounts, while real estate companies (22.36% of total politically connected buyers) acquire land parcels at premia.

Because unobserved differences could cause the price difference between treatment and control groups, we perform robustness checks with the following two-way matching approaches. In addition to the spatial matching criteria, we further require land parcels in each matched pair to (i) have similar land size (measured as the difference in land size between matched land parcels purchased by politically connected firms and by other firms

being less than one standard deviation apart), (ii) have identical usage type, and (iii) be sold through the same land sales method. For example, by conducting Spatial + Land Size matching in column 1, we match each land parcel purchased by a politically connected firm with land parcels of similar size (i.e., size matching) purchased in the same year and within a 1,500-meter radius (i.e., spatial matching). We do the same for Spatial + Usage and Spatial + Supply matching approaches. Table 4 shows that the results from the three different two-way matching approaches draw similar conclusions as our baseline results in Table 3.

4.2 Different land sales methods

Different land sales methods have different levels of information transparency. Among four market-oriented land sales methods, negotiation is commonly viewed as opaquest (see Qin et al., 2016), while English auction is the most transparent (see Cai et al., 2017). Since participants in an English auction can acquire more information by observing others' bidding behavior, English auction is more transparent than sealed-bid auction (McAfee and McMillan, 1987) and leads to higher prices (Chow and Ooi, 2014). The most used land sales method, two-stage auction (69.7% of land transactions), is also less informationally transparent than English auction, because local authorities and privileged firms may reach an under-the-table side deal during the first stage (Cai et al., 2013). To further verify that the price discount obtained by subsidiaries of politically connected firms is a result of market manipulation rather than market competition, we divide the treatment group based on land sales methods and use spatial matching method to re-construct the control groups and repeat the tests.

The regression results for different land sales method subsamples presented in Table 5 confirm our hypothesis H2. The subsidiaries of politically connected firms are able to obtain a 27.8-37.9% discount through negotiations (the sum of coefficients of *Connected* and *Connected* × *Subsidiary* in columns 1 and 5) and a 6.2-8.5% price discount through two-stage auctions (columns 3 and 7). Moreover, the price differences between headquarters and subsidiaries of politically connected firms (captured by coefficients of *Connected* × *Subsidiary*) are negatively significant for sealed bid auctions (columns 2 and 6) and two-stage auctions, showing that the use of subsidiaries for buying land can effectively exploit discounts even with these sales methods. For negotiations, although the coefficients of *Connected* × *Subsidiary* are insignificant, the magnitude of *Connected* × *Subsidiary* for negotiated sales is similar to that for two-stage auctions. In contrast, we could not observe significant price discounts in the most transparent English auctions from columns 4 and 8. To sum up, the benefits of implicit political connections through land price discounts obtained by subsidiaries of politically connected firms are driven by informationally opaque land sales methods rather than locational informational advantage.

4.3 Different land use types

To further quantify the impact of two possible channels (i.e., namely government subsidies or corruption) on land prices, we re-construct the treatment groups by grouping land transactions made by politically connected firm based on land usage types. As before, we use the spatial matching method to re-generate comparable control groups for each treatment group, and repeat baseline regressions on different land usage type subsamples.

Table 6 shows that, when purchasing residential land parcels, only subsidiaries of politically connected firms can obtain a statically significant price discount of 18.5-25.1% (the sum of coefficients of *Connected* and *Connected* × *Subsidiary* in Wald tests), even though the price difference between their subsidiaries and headquarters is insignificant (the coefficients of *Connected* × Subsidiary are insignificant and are –0.072 and –0.025 for the 1,500-meter radius and 500-meter radius, respectively). The results for commercial land parcels are interesting. The opposite signs of the coefficients of *Connected* and *Connected* × *Subsidiary* imply that politically connected firms still pay lower prices when purchasing commercial land parcels through their subsidiaries but (insignificantly) higher prices through their headquarters. For industrial land, the coefficients of *Connected* × *Subsidiary* are negatively significant as in our main results. More importantly, for subsidiaries of connected firms, their price discount for industrial land is less than one third of the price discount for other land (the sum of coefficients of *Connected* and *Connected* × *Subsidiary* are –0.185, –0.056, and –0.189 for residential land, industrial land, and commercial land respectively for the 1,500-meter radius matched sample). Overall, the price discounts obtained by subsidiaries of politically connected firms are mostly driven by less subsidized residential land and commercial land (i.e., corruption hypothesis H3a), and not as incentives for local economic growth (i.e., government subsidy hypothesis H3b).

4.4 The anti-corruption campaign

Under the anti-corruption campaign initiated by President Xi Jinping in November 2012, the Central Commission for Discipline Inspection (CCDI) has regularly (twice or three times a year) sent multiple central inspection teams to selected provinces, government

agencies, SOEs, and universities since May 2013. Previous studies indicate that the anti-corruption campaign effectively curtails luxury expenditures of government officials (Lan and Li, 2018) and reduces their willingness to provide favorable treatments, such as court advantage (Zhang, 2023) and land price discount (Chen and Kung, 2019), to politically connected firms. We therefore use the anti-corruption campaign as a quasi-natural experiment to verify the corruption hypothesis H3b. We employ a dummy variable, *Post*-2013, to distinguish land transactions made on or after 2013. Moreover, because the anti-corruption campaign is expected to mitigate the impact of explicit and implicit political ties simultaneous, we could further use land parcels sold to the headquarters of politically connected firms (i.e., firms with explicit political ties) as an additional control group to relax the parallel trend assumption in a traditional difference in difference (DiD) model. Our triple-difference (DDD) model is as follows:

$$\begin{aligned} Price_{i,b,j,s,t} = {} & \beta_0 + \beta_1 Connected_{b,t} + \beta_2 Connected_{b,t} \times Subsidiary_{b,t} \\ & + \beta_3 Connected_{b,t} \times Post\text{-}2013 \\ & + \beta_4 Connected_{b,t} \times Subsidiary_{b,t} \times Post\text{-}2013 \\ & + \gamma X_{i,t} + \omega_{s,t} + \varphi_{j,t} + v_{i,b,j,s,t} \end{aligned} \quad (2)$$

where $Post\text{-}2013$ is the post-event identifier. Because the impact of the anti-corruption campaign on local economies can be absorbed by city-year fixed effects and usage-year fixed effects, we have not added *Post*-2013 in Equation (2). The other variables are the same as in Equation (1). The main parameter of interest, β_4, captures the average change in the price differences between subsidiaries and headquarters of politically connected firms after the anti-corruption campaign. Standard errors are clustered at the firm-level.

Columns 1 and 2 of Table 7 report the baseline results of the triple difference model. Coefficients of *Connected* × *Subsidiary* × *Post*-2013 are positively significant regardless of sample matching methods. This supports hypothesis H3b that the anti-corruption campaign has significantly reduced the difference between subsidiaries and headquarters of connected firms. In terms of economic significance, before the anti-corruption campaign, subsidiaries of politically connected firms pay 16.5%-17.2% less than their headquarters (captured by the coefficients of *Connected* × *Subsidiary*). After the anti-corruption campaign, the price advantage of politically connected subsidiaries over headquarters has reduced by more than around two-thirds to 5.9%–6.3% and become insignificant.

The results are clearer when we further repeat DDD regressions on different land usage type subsamples. The results for residential land (columns 3 and 4) are also consistent with the corruption hypothesis H3b that politically connected firm subsidiaries' relative price advantages from acquiring residential land parcels have been eliminated by the anti-corruption campaign (coefficients of *Connected* × *Subsidiary* are offset by *Connected* × *Subsidiary* × *Post*-2013, as they have a similar magnitude but opposite signs).

Similarly, the price discount for politically connected subsidiaries only exists before the anti-corruption campaign for commercial land (columns 7 and 8). Interestingly, politically connected headquarters even pay premiums to acquire commercial land before the campaign, but not afterward. This result indicates that connected firms tend to build a good reputation by acquiring commercial land at premium prices through their headquarters, while hide the real benefits by acquiring commercial land at discount through their subsidiaries. The anti-corruption campaign effectively stops both behaviors.

Finally, for industrial land (columns 5 and 6), the coefficients of *Connected* × *Subsidiary* × *Post*-2013 are negatively significant, and the coefficients of *Connected* × *Subsidiary* are insignificant. This means that discounts as government subsidy for local economic growth are available after the anti-corruption campaign but not before.

To further evaluate the impact of the anti-corruption campaign, we interact key independent variables in Equation (1) with a series of year dummies and re-estimate the annual price discount/premium obtained by subsidiaries and headquarters of politically connected firms. As Figure 2 shows, subsidiaries of politically connected firms purchase land parcels at a discount of around 18% before the anti-corruption campaign, and the price discount declines gradually until 2017. As a comparison, Panel B of Figure 2 shows that headquarters of politically connected firms purchase land parcels at an insignificant price premium in 8 out of 14 years. We cannot observe any significant trend after the anti-corruption campaign.[11]

The land price discounts move together with the strength of the anti-corruption campaign as shown in Figure 3. The strength of the campaign was strongest in 2017, when the former party secretary Sun Zhengcai was impeached for corruption, and another national-level leader, Yang Jing, was removed from the Central Committee at the 19th National Congress in October 2017. The central authorities then diverted the focus to poverty alleviation campaign and moved the scope of work of the inspection teams from

[11] As shown in Table 2, politically connected headquarters have only purchased 343 land parcels (i.e., on average, 14 land parcels per year) in our sample. Thus, the dynamic estimates of price premium/ discount could be heavily influenced by outliers. Therefore, we refrain from interpreting the economic meaning of the price premium/ discount obtained by politically connected headquarters in Figure 2.

"anti-corruption" to "comprehensive supervision".[12] Discounts to subsidiaries appeared once again, although of lesser magnitude. This again provides supportive evidence that the land price discounts are mostly driven by corruption (i.e., hypothesis H3b).

4.5 Reciprocal relationship or government subsidy

The political connection identifier, *Connected*, cannot capture the strength of political tie (Leuz and Oberholzer-Gee, 2006) and may neglect political connections built through other stakeholders (Chen and Kung, 2019), which could lead to measurement errors. To mitigate this concern, we follow Hao et al. (2020) and use charitable donations, (*Donations/Assets*), as an alternative political connection measure, since firms are motivated to make charitable donations in exchange for political favors. In addition, we also employ government subsidies (*Subsidies/Assets*) to capture direct government intervention in allocating resources (e.g., Kalouptsidi, 2018) and to verify our hypothesis H3a. Key independent variables are lagged for one year to mitigate the concern of reverse causality. As we do not classify listed firms based on the political ties of top executives, we include all land transactions made by listed firms as the treatment group.

Columns 1 and 2 of table 8 shows that larger charitable donation expenses are subsequently associated by higher land prices for headquarters (the coefficients of *Donations/ Assets* are 1.638 and 1.967 for 1,500-meter radius and 500-meter radius

[12] The central government initiated the poverty alleviation campaign through the Thirteenth Five-Year Plan in March 2016 and broadened the scope of the policy to common prosperity through the Fourteenth Five-Year Plan in March 2021. Meanwhile, it reduced the strength of anti-corruption campaign by expanding the scope of work of the inspection team on July 14, 2017, as shown in "*Announcement of regulations of inspection teams '3.0 version', profound messages behind five major revisions*" published by Xinhua News Agency, the state press agency. See http://www.gov.cn/xinwen/2017-07/14/content_5210580.htm (in Chinese) for more details.

matched samples, respectively) while lower land prices for subsidiaries (the sum of coefficients of *Donations/ Assets* and *Donations/ Assets* × *Subsidiaries* are −1.025 and −0.823, respectively) in the following year, before the anti-corruption campaign. This result implies that firms use donations to exchange for lower land purchase prices through their subsidiaries, while covering these political favors by increasing land purchase prices through their headquarters. However, this reciprocal relationship has been eliminated by the anti-corruption campaign, as evidenced by the opposite signs and similar magnitudes of *Donations/ Assets* (*Donations/ Assets* × *Subsidiaries*) and *Donations/ Assets* × *Post*-2013 (*Donations/ Assets* × *Subsidiaries* × *Post*-2013).

Columns 3 and 4 show that the amount of government subsidies is negatively associated with land prices for subsidiaries in the subsequent year, and the overall impact of government subsidiaries has doubled in strength after the anti-corruption campaign (as shown in the Wald tests). This aligns with our findings in Section 4.4, suggesting that government-subsidized firms could reap even more political favors after the anti-corruption campaign and continue to use subsidiaries to hide their political favors.

4.6 Evidence Using Instrumental Variables

It is possible that a firm's decision of purchasing a land parcel through its subsidiary is due to the price of the land parcel, which can cause reverse causality in our tests. To address this, we take note that a firm may opt to purchase a land parcel through its local subsidiary if the land location is far from its headquarter, because its distant headquarter office has information disadvantage relative to local firms (Bae et al., 2008). Meanwhile, its subsidiary continues to compete with other local firms through the land auction process.

As a result, the distance between the headquarter office and the land parcels is expected to affect only the headquarter office's willingness for direct land purchase, rather than the land price. We, therefore, use the geographical distance between corporate headquarters and purchased land parcels (*Distance to Land*) as the instrument for *Subsidiary*.[13] The regression results of two-stage least squares regressions (2SLS) are presented in Table 9.

The second-stage regression results in columns 2 and 4 are consistent with our baseline results. The coefficients of the fitted value of *Connected* × *Subsidiary* are all negatively significant, implying that politically connected firms spend less when purchasing land parcels through their subsidiaries than through their headquarters, regardless of location. The signs and significance of instrumental variables (*Connected* × *Distance to Land*) in columns 1 and 3 are also as expected in that firms with headquarters farther away from the land parcels are more likely to purchase the land parcels by their subsidiaries (the coefficients of *Connected* × *Distance to land* are positively significant for *Connected* × *Subsidiary*). The robust *F*-statistics of the first-stage regressions in columns 1 and 3 well above the threshold of 10 (Staiger and Stock, 1997) alleviate the concern of weak instruments. Hence, our 2SLS verifies that the price discount obtained by politically connected subsidiaries is not due to reverse causality.

[13] Ideally, that would mean the subsidiary is closer to the land than the headquarter. Unfortunately, because of data unavailability, we are not able to identify the locations of subsidiaries of listed firms. The question of how politically connected firms choose subsidiaries to acquire land is worth further discussion whenever data is available.

4.7 Other robustness checks

Unlike private firms, SOEs are naturally connected to the government, and tend to receive disproportionally larger benefits from government stimulus than private firms (Cong et al., 2019). Huang et al. (2020) further show that local government debts due to fiscal stimulus would crowd out the investment of private firms but not the investment of SOEs. To differentiate the impact of political connections and government ownership, we further examine whether State ownership could influence the price discount obtained by subsidiaries of politically connected firms, by splitting the treatment group based on state ownership (i.e. land parcels purchased by politically connected SOEs and by non-SOEs). Table 10 shows that subsidiaries of politically connected non-SOEs always purchase land parcels at 10.8-11.3% lower prices than their headquarters (coefficients of *Connected* × *Subsidiary* in columns 1 and 2). For SOEs, the coefficients of *Connected*×*Subsidiary* are at most marginal significant.[14] In the aggregate (the sum of coefficients of *Connected* and *Connected* × *Subsidiary*), subsidiaries of politically connected non-SOEs could enjoy a price discount of 10.6-13.0%. On the other hand, it looks like political connection does not matter for SOEs.

Another consideration is that political connections is susceptible to local conditions. In particular, corruption is expected to be less severe in areas with more legal protection (e.g., Aidt, 2003; Johnson et al., 1998) and more developed private sectors (e.g., Nguyen and Van Dijk, 2012). We therefore include the province-level legal environment index and non-State sector development index from Wang et al. (2017, 2021) to examine whether and

[14] we cannot obtain reliable estimates of *Connected* and *Connected* × *Subsidiary* because the headquarters of politically connected SOEs have only purchased 64 land parcels in our sample period.

how local environmental factors affect the price discount obtained by subsidiaries of politically connected firms.[15] The results reported in Table 11 indeed show that the subsidiaries of politically connected firms enjoy larger land price discounts in regions with weaker legal protection and a lower level of non-state sector development.

As discussed in Section 4.1, we have dropped the variable, *Subsidiary*, from main regressions to avoid multicollinearity. We therefore cannot rule out that politically unconnected subsidiaries may also acquire land parcels at discount prices. To examine this alternative hypothesis, we consider land parcels purchased by all subsidiaries as the treatment group and use the above-mentioned spatial matching to re-generate the comparable control group. Table 12 shows that, on average, politically connected subsidiaries are able to obtain a significant land price discount, while unconnected subsidiaries cannot. More importantly, the positive and significant coefficients of *Connected* × *Subsidiary* × *Post*-2013 in columns 4 and 6 suggest that politically connected subsidiaries pay higher land prices after the anti-corruption campaign. On the contrary, the coefficients of *Unconnected* × *Subsidiary* × *Post*-2013 are insignificant and are much smaller in magnitude.

All these robustness tests reaffirm our main result that politically connected firms are able to acquire land at a discount price mostly through the corruption channel.

[15] As an alternative local condition index, City Momentum Index, developed by Jones Lane LaSalle, could capture cross-sectional regional development disparities, but it was launched in 2014 (after the anti-corruption campaign) and cannot capture time-series variations. We, therefore, have not included this index in our analysis.

4.8 Firm-level regressions

Despite the existence of implicit political benefits, firms do not necessarily intentionally exploit political benefits through implicit channels. We therefore further examine (i) whether politically connected firms would deliberately distort their investment strategies to exploit the benefits associated with the land price discount, and (ii) whether their investment distortion would disappear after the anti-corruption campaign. We aggregate transaction-level data to form firm-level annual data, and conduct two sets of firm-level regressions on the politically connected and unconnected listed firms.

In the first set of regressions, firms' preference for purchasing land parcels through their subsidiaries is regressed on the political connection identifier and control variables:

$$Y_{i,t} = \beta_0 + \beta_1 Connected_{i,t-1} + \beta_2 Connected_{i,t-1} \times Post\text{-}2013 + \delta X_{i,t-1} + u_i + v_t + \varepsilon_{i,t} \quad (3)$$

where $Y_{i,t}$ is one of the two measures (% *Land expenses through subsidiaries* or % *Land size through subsidiaries*) that captures firm *i*'s preference for purchasing land parcels through its subsidiaries over its headquarters at year *t*. % *Land expenses through subsidiaries*$_{i,t}$ is the percentage of expenses on land acquisitions made by subsidiaries of the listed firm *i* at year *t*, and % *Land size through subsidiaries*$_{i,t}$ is the percentage of land size purchased by subsidiaries of the listed firm *i* at year *t*.

We include Tobin's Q and revenue growth as controls for investment opportunities, return on assets (ROA) for profitability, tangible assets to total assets ratio for asset tangibility, liabilities to total assets ratio for financial leverage, and log of total assets for firm size (as in Benmelech and Frydman, 2015; Firth et al., 2012). We also include the ownership of the largest shareholder, the board size, CEO duality dummy, and independent

director ratio as corporate governance controls (See Appendix B for detailed definitions). All independent variables are lagged by one year to avoid endogeneity. We have also added industry and year fixed effects to absorb unobserved heterogeneity and adjust standard errors for firm-level clusters. The regression results are exhibited in Panel A of Table 13.

As expected, politically connected firms have a stronger preference to make land acquisitions through subsidiaries than unconnected firms (the coefficient of lagged *Connected* is 2.588 in column 2), but the anti-corruption campaign erased their stronger preference in 2013 and thereafter (the coefficient of lagged *Connected* × *Post*-2013 is –2.758). Even though the coefficients of lagged *Connected* and *Connected* × *Post*-2013 become insignificant when we use the alternative preference measure in columns 3 and 4, their signs and magnitudes are similar to those in columns 1 and 2.

The "stronger preference" for purchasing land parcels through subsidiaries could result from a higher purchase amount by subsidiaries or a lower purchase amount by headquarters. Hence, we replace the dependent variables in Equation (3) with expenses on land acquisition (or purchased land size) and run tests on subsidiaries and headquarters separately. The regression results in Panel B suggest that the politically connected firms prefer to buy land by their subsidiaries (the coefficients of lagged *Connected* are 0.155 and 0.094 for subsidiaries in columns 2 and 4, respectively, and insignificant for headquarters in columns 1 and 3 respectively), possibly to exploit the discounts less obviously. Again, the anti-corruption campaign has erased the differences between politically connected and unconnected firms.

5. Conclusions

This paper studies the impact of political connections on land purchase prices. Using land purchase prices data from China, we provide empirical evidence that politically connected firms use subsidiaries to hide their political favors. We find that politically connected listed firms pay similar prices as other firms when purchasing land parcels through their headquarters (explicit political ties), but 12.1-13.2% less when purchasing through their subsidiaries (implicit political ties). Consistent with the corruption hypothesis, land price discounts obtained by subsidiaries are larger when land parcels are disposed of through relatively informationally opaque supply methods (i.e., negotiations and two-stage auctions), among less subsidized land parcels (i.e., residential land and commercial land), and in regions with weaker legal protection and less developed private sectors. The anti-corruption campaign implemented in 2012 has effectively cracked down the price discounts obtained by subsidiaries of politically connected firms. Although the land price discount is primarily driven by corruption, empirical results show that subsidized firms also use subsidiaries to hide their political favors. Unlike land price discounts due to corruption, land price discounts due to government subsidies have been amplified rather than diminished following the anti-corruption campaign.

We contribute by showing that politically connected firms blur the existence of corruption by using headquarter-subsidiary relationships to hide their rent-seeking practice. While the prior literature has documented the impact of explicit political connections (mainly explicit) on firm performance and the benefit-sharing phenomenon within social networks, connected firms cannot directly benefits from this benefit-sharing mechanism. By focusing on headquarter-subsidiary relationships (i.e., intra-firm networks) and political

connections of listed firms, we show that politically connected firms can build a good company image from their headquarters not engaging in rent-seeking behavior, without revealing that they exploit the benefits through their subsidiaries. We also confirm that the Anti-corruption Campaign has largely removed land price distortions due to corruption, while leaving price distortions due to government subsidies unchanged. It deserves further investigation in future studies on whether politically connected firms can hide their rent-seeking behaviors through other inter- and intra-organizational networks, such as purchasing land parcels through firms controlled by the same large shareholders and by other "seemingly unrelated" unlisted firms and individuals, when data is readily available.

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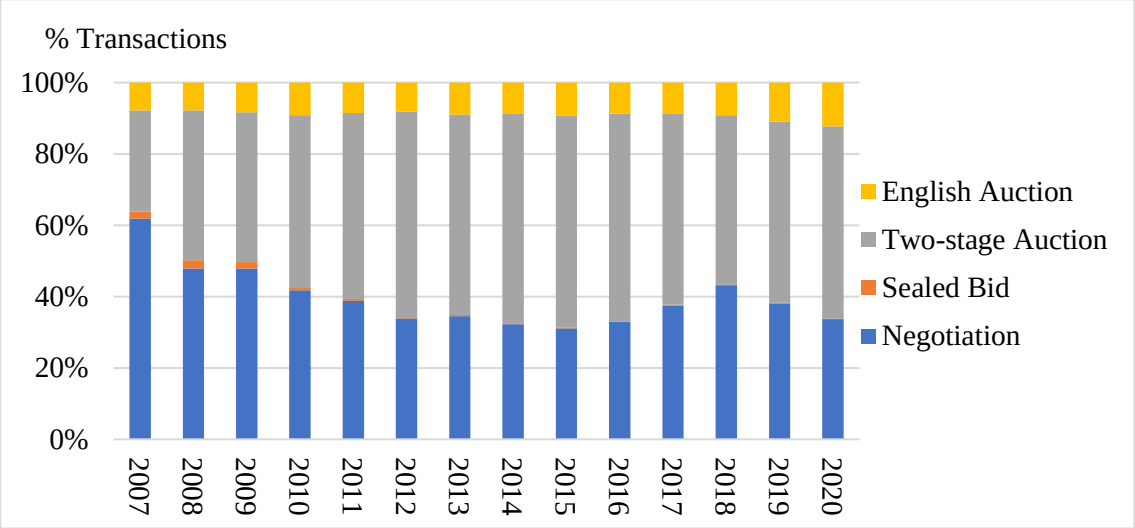
Figures and Tables

Panel A: Market share by number of land transactions



Panel B: Market share by land size

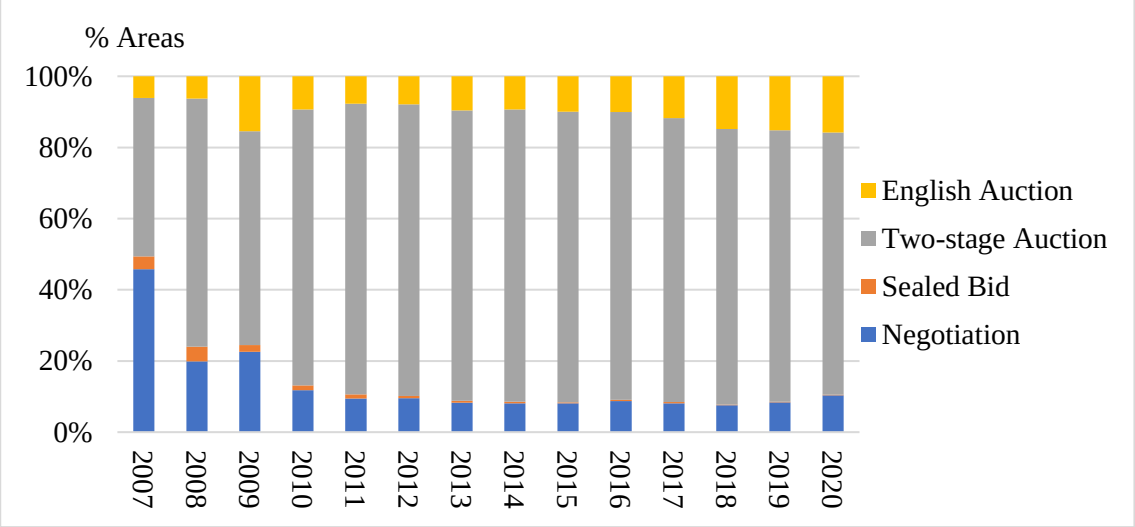
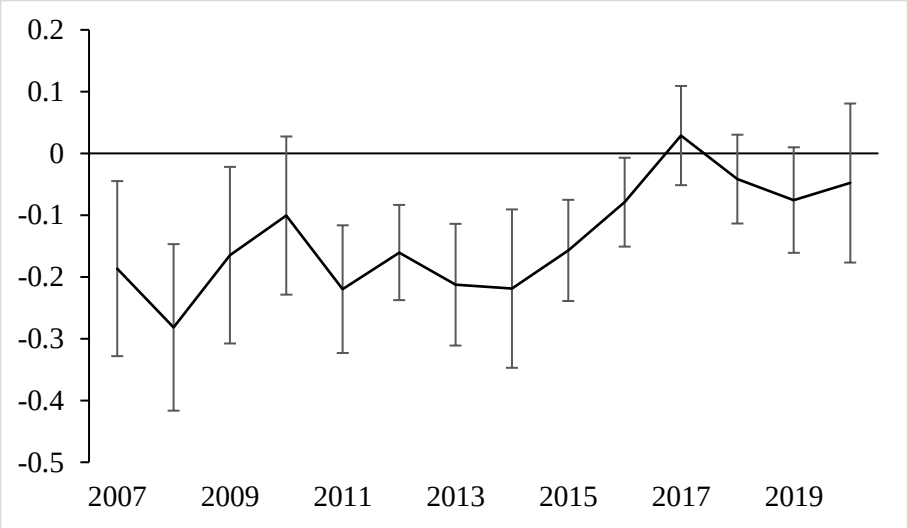


Figure 1 Share of land sold through different land sales methods

Source: http://www.landchina.com

Notes: % Transactions (% Areas) denotes the share of land sold through different land sales methods in terms of the number of transactions (the area of land sold).

Panel A: Price discount/ premium for subsidiaries of connected firms



Panel B: Price discount/ premium for headquarters of connected firms

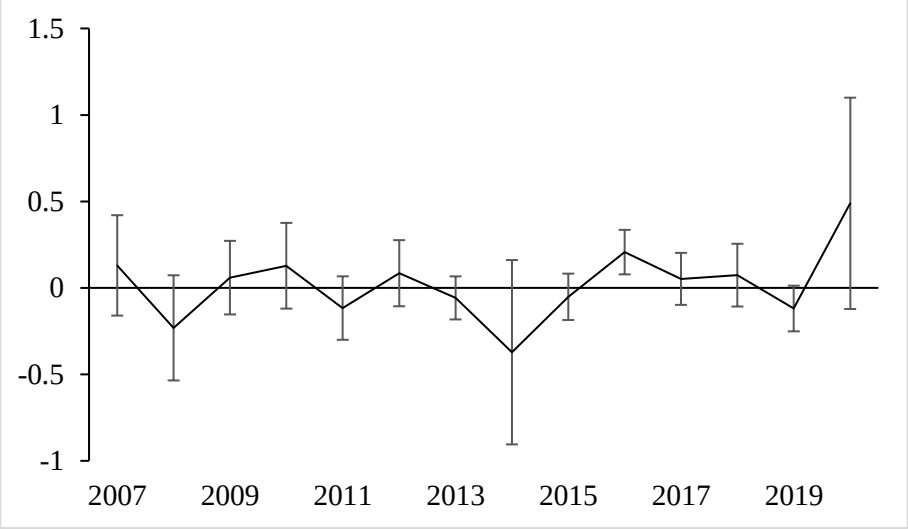


Figure 2 Price discount/ premium for politically connected firms

Notes: The price discount/ premium for connected subsidiaries (headquarters) denote the difference between land prices paid by subsidiaries (headquarters) of politically connected firms and land prices of nearby comparable land parcels (i.e., land transactions within a 1,500-meter radius and in the same year). We have also controlled the impact of a wide range of control variables and fixed effects specified in Equation (1).

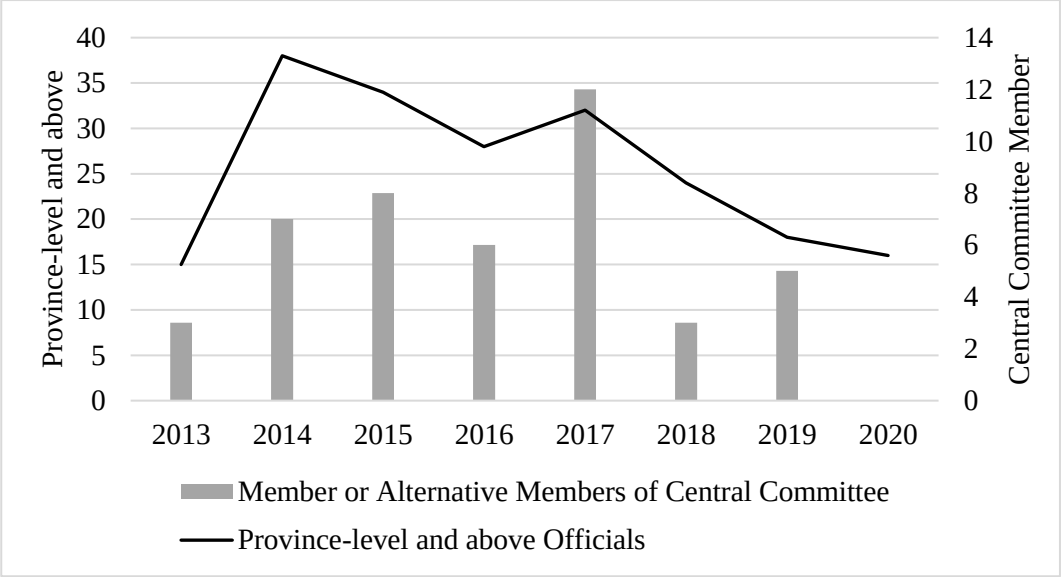


Figure 3 Number of high-ranked officials facing corruption charges

Notes: The data is manually collected from China Economic Net's Local Party and Government Leaders Database (www.ce.cn).

Table 1 Summary statistics of land transactions

This table reports summary statistics of land transactions in the full and matched samples. The sample period ranges from January 2007 to August 2020. In the matched sample (Panels B and C), we match each land parcel purchased by politically connected firms with land parcels purchased in the same year and within a 1,500-meter radius.

	Politically Connected Listed Firms		Other Firms	
	Mean	S. D.	Mean	S. D.
Panel A: Full Sample				
Land price (*yuan*/ sq. m)	2,605.464	9,845.661	2,044.499	512,688.927
Land size (sq. m)	48,856.851	147,582.885	34,238.875	478,747.556
Land quality	4.869	4.381	5.011	4.498
Listed	1.000	0.000	0.027	0.162
Subsidiary	0.931	0.254	0.025	0.156
Land usage type				
Residential	0.209	0.407	0.322	0.467
Industrial	0.342	0.474	0.442	0.497
Commercial	0.340	0.474	0.198	0.398
Other	0.109	0.312	0.039	0.192
Supply method				
Negotiation	0.202	0.402	0.136	0.343
Sealed bid	0.012	0.107	0.007	0.084
Two-stage auction	0.697	0.460	0.755	0.430
English auction	0.089	0.285	0.101	0.302
# of transactions		22,463		882,013
Panel B: ≤ 1,500 Meters				
Land price (*yuan*/ sq. m)	2,605.464	9,845.661	1,895.177	7,738.050
Land size (sq. m)	48,856.851	147,582.885	38,170.560	89,222.116
Land quality	4.869	4.381	5.019	4.442
Listed	1.000	0.000	0.033	0.179
Subsidiary	0.931	0.254	0.030	0.171
Land usage type				
Residential	0.209	0.407	0.310	0.463
Industrial	0.342	0.474	0.440	0.496
Commercial	0.340	0.474	0.211	0.408
Other	0.109	0.312	0.039	0.195
Supply method				
Negotiation	0.202	0.402	0.127	0.332
Sealed bid	0.012	0.107	0.007	0.086
Two-stage auction	0.697	0.460	0.777	0.416
English auction	0.089	0.285	0.089	0.285
# of transactions		22,463		72,585

Panel C: Average land price for different types of firms in the matched sample (*yuan*/ sq. m)

	Politically Connected Listed Firms		Unconnected Listed Firms		Unlisted Firms
	Headquarter	Subsidiary	Headquarter	Subsidiary	
Residential land	10,261.48	6,496.09	16,475.99	10,957.63	3,156.87
Industrial land	424.44	304.56	415.51	409.37	269.69
Commercial land	10,073.57	2,872.10	16,647.81	5,495.13	3,245.50
Other land	666.93	376.72	1,137.21	811.30	609.44

Table 2 Characteristics of land buyers

Panel A reports the distribution of land buyers in the full and matched samples (within a 1,500-meter radius). Panel B describes the sectoral distribution of firms in the matched sample.

Panel A: Distribution of land buyers				
	All Sample		≤1,500 meters	
	# of Firms	% of Firms	# of Firms	% of Firms
Listed firms (Including subsidiaries)	22,423	4.16%	11,205	21.17%
Politically connected listed firms	9,863	1.83%	9,863	18.63%
Headquarters	343	0.06%	343	0.65%
Subsidiaries and Branches	9,520	1.77%	9,520	17.98%
Unconnected listed firms	12,560	2.33%	1,342	2.54%
Headquarters	606	0.11%	75	0.14%
Subsidiaries and Branches	11,954	2.22%	1,267	2.39%
Unlisted firms	515,961	95.84%	41,731	78.83%
Total firms	538,384		52,936	

Panel B: Sectoral distribution for the matched sample (≤1,500 meters)						
	Listed firms				Unlisted firms	
	Politically Connected		Unconnected			
	# of Firms	% of Firms	# of Firms	% of Firms	# of Firms	% of Firms
Sector						
Accommodation and catering services	106	1.07%	11	0.82%	530	1.27%
Agriculture	116	1.18%	8	0.60%	510	1.22%
Construction	95	0.96%	19	1.42%	696	1.67%
Cultural, sports and entertainment services	58	0.59%	5	0.37%	186	0.45%
Education	35	0.35%	3	0.22%	111	0.27%
Electricity, gas, and water supply	350	3.55%	43	3.20%	554	1.33%
Environment and public facilities	106	1.07%	8	0.60%	262	0.63%
Financials	464	4.70%	39	2.91%	425	1.02%
Health and social services	45	0.46%	4	0.30%	103	0.25%
Leasing and business services	414	4.20%	35	2.61%	1,514	3.63%
Manufacturing	3,005	30.47%	503	37.48%	17,513	41.97%
Mining	145	1.47%	10	0.75%	265	0.64%
Other	714	7.24%	120	8.94%	3,462	8.30%
Other services	178	1.80%	12	0.89%	608	1.46%
Real estate	2,205	22.36%	363	27.05%	10,803	25.89%
Research and technical services	147	1.49%	26	1.94%	455	1.09%
Software and information technology services	436	4.42%	27	2.01%	511	1.22%
Transportation and storage	355	3.60%	60	4.47%	1,548	3.71%
Wholesale and retail trade	889	9.01%	46	3.43%	1,675	4.01%
Total	9,863		1,342		41,731	

Table 3 Political connections and land price

Table 3 presents the baseline regression results of Equation (1), which estimates the price differences between the land parcels purchased by the headquarter of politically connected firms, the subsidiaries of politically connected firms, and other firms. The dependent variable is measured as a log of land price (*yuan* per square meter). *Connected* is a dummy variable that equals 1 if a politically connected firm purchases the land parcel. The *Subsidiary* is a dummy variable that equals 1 if the land parcel is purchased by a subsidiary or branch of a listed firm. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm and province-level. The Wald tests examine the statistical significance of the sum of coefficients. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported, and detailed coefficients estimates are reported in Appendix C due to space limitations.

	Log of land price					
	Full	Full	≤ 1500M	≤ 500M	≤ 1500M	≤ 1500M
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	-0.022	0.097**	-0.019	-0.014	0.009	0.033
	(-0.886)	(2.105)	(-0.332)	(-0.209)	(0.165)	(0.285)
Connected × Subsidiary		-0.128***	-0.113***	-0.107***	-0.141***	-0.258***
		(-2.910)	(-2.915)	(-2.778)	(-3.046)	(-4.371)
Wald tests: Coef. of *Connected* + Coef. of *Connected* × *Subsidiary*						
		-0.031	-0.132***	-0.121**	-0.132***	-0.225**
Control variables	Y	Y	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y	Y	Y
City fixed effects	-	-	-	-	Y	-
Usage fixed effects	-	-	-	-	Y	-
Year fixed effects	-	-	-	-	Y	-
City-year fixed effects	Y	Y	Y	Y	-	-
Usage-year fixed effects	Y	Y	Y	Y	-	-
Observations	904,353	904,353	95,085	73,566	95,085	95,200
Adjusted R-squared	0.619	0.619	0.695	0.709	0.650	0.427

Table 4. Robustness checks with two-way matching approach

In Table 4, we adopt several two-way matching approaches and repeat Equation (1) on each matched sample as robustness checks. In addition to the spatial matching criteria specified in Section 3, we further require each matched observation pair to have a similar land size (i.e., the difference in land size between matched land parcels purchased by politically connected firms and by other firms is less than one standard deviation away from zero) in columns 1 and 2. Similarly, we additionally require each matched observation pair to have an identical usage type in columns 3 and 4, and to be sold through the identical supply method in columns 5 and 6. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm and province-level. The Wald test examines the statistical significance of the sum of coefficients. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price					
	Spatial + Land Size		Spatial + Usage		Spatial + Supply	
	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	-0.053	-0.044	0.000	-0.014	0.005	0.007
	(-0.821)	(-0.568)	(0.005)	(-0.220)	(0.103)	(0.118)
Connected × Subsidiary	-0.102**	-0.104**	-0.101**	-0.099**	-0.113***	-0.109***
	(-2.585)	(-2.653)	(-2.593)	(-2.553)	(-2.872)	(-2.762)
Wald tests: Coef. of *Connected* + Coef. of *Connected* × *Subsidiary*						
	-0.155***	-0.148**	-0.101**	-0.113**	-0.108***	-0.102**
Control variables	Y	Y	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y	Y	Y
Observations	73,885	59,386	58,344	49,693	80,494	65,343
Adjusted R-squared	0.709	0.725	0.741	0.752	0.717	0.727

Table 5 Different land sales methods

Table 5 presents regression results on different land sales method subsamples. We re-construct treatment groups by grouping land parcels purchased by politically connected firms based on land sales methods and use spatial matching to generate control groups for each treatment group. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm size dummies, listed status, and industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. The Wald test examines the statistical significance of the sum of coefficients. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price							
	≤ 1500M				≤ 500M			
	Negotiation	Sealed Bid	Two-stage	English	Negotiation	Sealed Bid	Two-stage	English
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Connected	-0.136	0.968**	0.025	-0.039	-0.231	1.021*	0.047	-0.013
	(-0.574)	(2.154)	(0.550)	(-0.232)	(-0.844)	(1.885)	(1.038)	(-0.075)
Connected × Subsidiary	-0.142	-0.951**	-0.110***	0.002	-0.148	-0.867*	-0.109***	-0.005
	(-0.696)	(-2.286)	(-2.628)	(0.009)	(-0.661)	(-1.684)	(-2.655)	(-0.032)
Wald tests: Coef. of *Connected* + Coef. of *Connected* × *Subsidiary*								
	-0.278**	0.017	-0.085***	-0.037	-0.379**	0.154	-0.062**	-0.018
Control variables	Y	Y	Y	Y	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	18,735	1,264	73,188	9,327	13,764	1,057	57,990	7,072
Adjusted R-squared	0.571	0.866	0.743	0.782	0.548	0.890	0.762	0.799

Table 6 Different land usage types

Table 6 presents regression results on different land usage type subsamples. To compare like with like, we re-construct treatment groups by grouping land parcels purchased by politically connected firms based on their land usage types (i.e., residential land, industrial land, commercial land, and other land), and use spatial matching to generate comparable control groups for each treatment group. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. The Wald test examines the statistical significance of the sum of coefficients.*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price					
	Residential Land		Industrial Land		Commercial Land	
	≤1,500M	≤500M	≤1,500M	≤500M	≤1,500M	≤500M
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	-0.113	-0.226	0.013	0.034	0.106	0.179
	(-0.610)	(-1.203)	(0.297)	(0.779)	(0.903)	(1.351)
Connected × Subsidiary	-0.072	-0.025	-0.069**	-0.087***	-0.295***	-0.344***
	(-0.426)	(-0.151)	(-1.988)	(-2.742)	(-2.609)	(-2.749)
Wald tests: Coef. of *Connected* + Coef. of *Connected* × *Subsidiary*						
	-0.185***	-0.251***	-0.056**	-0.053*	-0.189***	-0.165***
Control variables	Y	Y	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y	Y	Y
Observations	20,356	14,251	42,463	34,811	36,905	27,753
Adjusted R-squared	0.709	0.731	0.728	0.733	0.711	0.726

Table 7 The impact of anti-corruption campaign

Table 7 reports the regression results of the triple difference model (DDD) specified in Equation (2). The anti-corruption campaign is used as the external shock. *Post*-2013 equals 1 on and after 2013, and zero otherwise. *Post-Inspection Visits* equals 1 after the first visit of the central inspection team in each province and zero otherwise. All other variables are the same as in Equation (1). Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. As in the main regressions, we have included city-year, usage-year and month fixed effects to absorb unobserved heterogeneity. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price							
	Full Sample		Residential Land		Industrial Land		Commercial Land	
	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Connected	-0.021	-0.015	0.025	-0.119	-0.014	0.002	0.259**	0.344**
	(-0.551)	(-0.378)	(0.259)	(-1.141)	(-0.408)	(0.053)	(2.084)	(2.400)
Connected × Subsidiary	-0.172***	-0.165***	-0.283***	-0.211**	-0.022	-0.037	-0.534***	-0.581***
	(-5.045)	(-4.566)	(-3.148)	(-2.324)	(-0.753)	(-1.262)	(-4.437)	(-4.210)
Connected × Post-2013	-0.001	-0.009	-0.235	-0.176	0.048	0.056	-0.336**	-0.361*
	(-0.022)	(-0.167)	(-1.251)	(-0.959)	(1.213)	(1.397)	(-1.998)	(-1.947)
Connected × Subsidiary × Post-2013	0.109**	0.106**	0.367*	0.314*	-0.081*	-0.086**	0.530***	0.520***
	(2.061)	(1.972)	(1.950)	(1.699)	(-1.936)	(-2.078)	(3.135)	(2.796)
Wald tests: Coef. of *Connected* × *Subsidiary* + Coef. of *Connected* × *Subsidiary* × *Post*-2013								
	-0.063	-0.059	0.084	0.103	-0.103***	-0.123***	-0.004	-0.061
Control variables	Y	Y	Y	Y	Y	Y	Y	Y
Observations	94,932	73,417	20,356	14,251	42,463	34,811	36,905	27,753
Adjusted R-squared	0.695	0.709	0.709	0.732	0.728	0.733	0.711	0.726

Table 8 Alternative political connection measures

Table 8 presents regression results of alternative political connection measures. We include all the listed firms as the treatment group and use spatial matching to generate the control group for the treatment group. *Donations/ Assets* is calculated as the ratio of charitable donation expenses over total assets time 100, and *Subsidies/ Assets* is the ratio of government subsidies over total assets time 100. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. The Wald tests examine the statistical significance of the sum of coefficients. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price			
	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M
	(1)	(2)	(3)	(4)
Donations /Assets	1.638*	1.967*		
	(1.700)	(1.813)		
Donations/Assets × Subsidiary	-2.663**	-2.790**		
	(-2.685)	(-2.470)		
Donations /Assets × Post-2013	-1.488	-1.943		
	(-0.985)	(-1.128)		
Donations /Assets × Subsidiary × Post-2013	1.927	2.251		
	(1.197)	(1.243)		
Subsidies/Assets			0.021	0.023
			(0.657)	(0.771)
Subsidies/Assets × Subsidiary			-0.067*	-0.065*
			(-1.876)	(-1.897)
Subsidies/Assets × Post-2013			0.056	0.032
			(0.913)	(0.525)
Subsidies/Assets × Subsidiary × Post-2013			-0.088	-0.082
			(-1.557)	(-1.421)
Constant	6.342***	5.523***	6.309***	5.508***
	(32.088)	(19.767)	(30.879)	(19.676)
Wald Tests: Coef. of Donations/Assets + Coef. of Donations/ Assets × Subsidiary	-1.025**	-0.823**		
Coef. of Donations/Assets × Post-2013 + Coef. of Donations/Assets × Subsidiary × Post-2013	-0.736	-0.539		

(To be continued…)

(Table 8 continued)

	Log of land price			
	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M
	(1)	(2)	(3)	(4)
Coef. of Subsidies/Assets + Coef. of Subsidies/Assets × Subsidiary				
			-0.046***	-0.042**
Coef. of Subsidies /Assets × Post-2013 + Coef. of Subsidies /Assets × Subsidiary × Post-2013				
			-0.155**	-0.147**
Control variables	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y
Observations	172,166	134,891	172,166	134,891
Adjusted R-squared	0.691	0.708	0.692	0.708

Table 9 Robustness checks with 2SLS

Table 9 exhibits the results of two-stage least squares (2SLS) regressions. We use the distance between corporate headquarters and purchased land parcels (*Distance to land*) as an instrument for the *Subsidiary*, to mitigate the endogeneity concern that the dependent variable (i.e., *log of land price*) may also affect key independent variables (i.e., *Subsidiary*). Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm and province. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	≤ 1500M		≤ 500M	
	1st stage	2nd stage	1st stage	2nd stage
	Connected ×Subsidiary	Log of price	Connected ×Subsidiary	Log of price
	(1)	(2)	(3)	(4)
Connected × Distance to land	0.118***		0.113***	
	(43.486)		(37.770)	
Connected		0.157		0.134
		(1.140)		(0.890)
Connected × Subsidiary		-0.304**		-0.268*
		(-2.093)		(-1.715)
Wald tests: Coef. of *Connected* + Coef. of *Connected* × *Subsidiary*				
		-0.147***		-0.134**
Control variables	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y
Observations	95,061	95,061	73,543	73,543
Adjusted R-squared	0.921	0.695	0.917	0.709
Robust F-statistic (instruments)	103.066		95.879	
F-statistic *p*-value	0.000		0.000	

Table 10 SOEs versus non-SOEs

Table 10 shows results of whether state ownership could affect the price discount obtained by subsidiaries of politically connected firms. We re-construct treatment groups based on state ownership (land parcels purchased by politically connected SOEs versus non-SOEs), and use spatial matching to generate control groups for each treatment group. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm and province. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price			
	Non-SOEs		SOEs	
	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M
	(1)	(2)	(3)	(4)
Connected	-0.017	0.002	0.412	-0.148
	(-0.270)	(0.031)	(1.536)	(-0.436)
Connected × Subsidiary	-0.113***	-0.108**	-0.259*	0.018
	(-2.820)	(-2.585)	(-1.766)	(0.102)
Wald test: Coef. of *Connected* + Coef. of *Connected* × *Subsidiary*				
	-0.130**	-0.106*	0.153	-0.130
Control variables	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y
Observations	89,548	69,444	6,172	4,551
Adjusted R-squared	0.699	0.713	0.691	0.718

Table 11 Legal environment and private sector development

Table 11 exhibits whether the legal environment and private sector development could affect the price discount obtained by subsidiaries of politically connected firms. *Private sector score* and *Legal system score* capture the level of non-state sector development and legal environment (Wang et al. 2017, 2021), respectively. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm and province-level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price			
	≤ 1500M	≤ 500M	≤ 1500M	≤ 500M
	(1)	(2)	(3)	(4)
Connected	0.033	0.041	0.254	0.261
	(0.317)	(0.374)	(1.675)	(1.659)
Connected × Subsidiary	-0.255***	-0.257***	-0.524***	-0.498***
	(-3.235)	(-3.279)	(-3.990)	(-3.671)
Connected × Legal system score	-0.006	-0.006		
	(-0.746)	(-0.781)		
Connected × Subsidiary × Legal system score	0.015**	0.016**		
	(2.165)	(2.301)		
Connected × Private sector score			-0.030*	-0.031*
			(-1.772)	(-1.742)
Connected × Subsidiary × Private sector score			0.048***	0.045***
			(3.284)	(3.023)
Wald test: Coef. of *Connected* + Coef. of *Connected* × *Subsidiary*				
	-0.222***	-0.216***	-0.270***	-0.237***
Control variables	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y
Observations	95,061	73,543	95,061	73,543
Adjusted R-squared	0.695	0.709	0.695	0.709

Table 12 Politically connected vs unconnected subsidiaries

Table 12 shows results of the land prices paid by politically connected and unconnected subsidiaries. *Connected* (*Unconnected*) is a dummy variable that equals 1 if the land parcel is purchased by a politically connected (unconnected) firm. Control variables include land size, land sales method dummies, land quality dummies, firm ownership, firm listed status, firm size dummies, and firm industry dummies. The definitions of variables are specified in Appendix B. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm and province-level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Constant terms are not reported.

	Log of land price					
	≤ 1500M				≤ 500M	
	(1)	(2)	(3)	(4)	(5)	(6)
Subsidiary	-0.113		-0.115		-0.092	
	(-1.685)		(-1.408)		(-1.231)	
Connected × Subsidiary	-0.016	-0.129**	-0.055	-0.170***	-0.056	-0.148**
	(-0.785)	(-2.090)	(-1.301)	(-2.826)	(-1.455)	(-2.652)
Unconnected × Subsidiary		-0.113		-0.115		-0.092
		(-1.687)		(-1.409)		(-1.232)
Subsidiary × Post-2013			0.003		-0.018	
			(0.099)		(-0.486)	
Connected × Subsidiary × Post-2013			0.074*	0.077***	0.097**	0.079***
			(1.723)	(2.849)	(2.418)	(3.389)
Unconnected × Subsidiary × Post-2013				0.003		-0.018
				(0.099)		(-0.486)
Control variables	Y	Y	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y	Y	Y
City-year fixed effects	Y	Y	Y	Y	Y	Y
Usage-year fixed effects	Y	Y	Y	Y	Y	Y
Observations	148,241	148,241	148,241	148,241	106,634	106,634
Adjusted R-squared	0.700	0.700	0.700	0.700	0.723	0.723

Table 13 Firm-level regressions

In this table, we examine whether the price discount obtained by subsidiaries of politically connected firms could distort firm investment decisions. In Panel A, the dependent variables are firms' preference for purchasing land parcels through their subsidiaries over through their headquarters. In Panel B, the dependent variables are expenses on land acquisition (purchased land size) of firms' subsidiaries and headquarters. The political connection identifier, *Connected* equals 1 if a firm has a politically connected CEO or board chairperson. The anti-corruption identifier, *Post*-2013, equals 1 on or after 2013. The definitions of control variables are specified in Appendix B. Firm-clustered standard errors are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Political connections on firm-level investment decisions

	% Land expenses through subsidiaries		% Land size through subsidiaries	
	(1)	(2)	(3)	(4)
Connected (*t*-1)	0.786	2.588**	0.698	2.067
	(0.893)	(2.083)	(0.780)	(1.633)
Connected (*t*-1) × Post-2013		-2.758**		-2.095
		(-2.122)		(-1.586)
Tobin Q (*t*-1)	0.002***	0.002**	0.002**	0.002**
	(2.626)	(2.517)	(2.493)	(2.410)
Log of assets (*t*-1)	6.307***	6.318***	6.567***	6.576***
	(9.446)	(9.449)	(9.821)	(9.822)
Tangible assets/Assets (*t*-1)	0.039	0.041	0.046	0.047
	(0.903)	(0.934)	(1.038)	(1.061)
Largest ownership (*t*-1)	0.085*	0.083*	0.083*	0.082*
	(1.861)	(1.825)	(1.810)	(1.782)
CEO duality (*t*-1)	-0.965	-0.994	-0.551	-0.573
	(-1.110)	(-1.144)	(-0.624)	(-0.649)
Board size (*t*-1)	0.846	0.880	1.163	1.189
	(0.319)	(0.331)	(0.437)	(0.446)
Ind director/Board (*t*-1)	-0.029	-0.030	0.029	0.028
	(-0.374)	(-0.385)	(0.370)	(0.362)
Revenue growth (*t*-1)	0.014**	0.014**	0.012*	0.012*
	(2.140)	(2.106)	(1.831)	(1.805)
ROA (*t*-1)	0.224***	0.223***	0.218***	0.217***
	(5.389)	(5.361)	(5.182)	(5.160)
Leverage (*t*-1)	-0.041	-0.039	-0.043	-0.042
	(-1.541)	(-1.472)	(-1.633)	(-1.580)
Constant	-126.349***	-127.285***	-134.210***	-134.921***
	(-7.365)	(-7.413)	(-7.832)	(-7.869)
Wald test: Coef. of *Connected* (*t*-1) + Coef. of *Connected* (*t*-1) × *Post*-2013		-0.170		-0.028

(To be continued…)

(Panel A Continued)

	% Land expenses through subsidiaries		% Land size through subsidiaries	
	(1)	(2)	(3)	(4)
Industry fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
Observations	26,183	26,183	26,183	26,183
No. of firms	2,886	2,886	2,886	2,886
Adjusted R-squared	0.040	0.040	0.039	0.039

Panel B: Acquiring land through subsidiaries versus through headquarters

	Land expenses/ Assets		Purchased land size	
	Headquarters	Subsidiaries	Headquarters	Subsidiaries
	(1)	(2)	(3)	(4)
Connected (*t*-1)	0.000	0.155**	0.011	0.094**
	(0.013)	(2.272)	(0.529)	(2.477)
Connected (*t*-1) × Post-2013	-0.016	-0.124	-0.021	-0.073*
	(-1.241)	(-1.621)	(-0.991)	(-1.898)
Tobin Q (*t*-1)	0.000***	-0.000	0.000***	0.000***
	(2.981)	(-0.254)	(3.574)	(3.837)
Log of assets (*t*-1)	-0.004	-0.103**	0.025***	0.206***
	(-0.715)	(-2.412)	(3.477)	(9.925)
Tangible assets/Assets (*t*-1)	0.001*	0.001	0.001	0.002**
	(1.910)	(0.423)	(1.556)	(2.116)
Largest ownership (*t*-1)	0.000	0.004*	0.000	0.003**
	(1.138)	(1.793)	(0.435)	(2.246)
CEO duality (*t*-1)	0.013*	-0.057	0.030***	0.019
	(1.889)	(-1.294)	(2.628)	(0.812)
Board size (*t*-1)	0.032	-0.214	0.056	0.111
	(1.333)	(-1.369)	(1.312)	(1.429)
Ind director/Board (*t*-1)	0.001	0.004	0.001	0.000
	(1.037)	(0.913)	(0.506)	(0.100)
Revenue growth (*t*-1)	0.000	0.001*	0.000	0.001***
	(0.718)	(1.804)	(1.133)	(2.861)
ROA (*t*-1)	0.001***	0.003	0.001***	0.005***
	(2.952)	(1.400)	(2.683)	(4.196)
Leverage (*t*-1)	-0.000	0.001	-0.001**	-0.001
	(-0.893)	(0.476)	(-2.010)	(-1.162)
Constant	-0.053	2.507**	-0.697***	-4.657***
	(-0.377)	(2.166)	(-3.128)	(-8.554)
Wald test: Coef. of *Connected* (*t*-1) + Coef. of *Connected* (*t*-1) × *Post*-2013				
	-0.016*	0.031	-0.010	0.021
Industry fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
Observations	26,183	26,183	26,183	26,183
No. of firms	2,886	2,886	2,886	2,886
Adjusted R-squared	0.013	0.019	0.013	0.047

Appendices

Appendix A. Procedure for matching land transaction data to firm-level data

We collect firm and subsidiary names from the CSMAR database and land transaction data from the China Land Market website (www.landchina.com). The China Land Market website provides detailed information on each parcel of land transaction, including the transaction date, transaction price, land size, land quality, geographic location (e.g., the address and the geographic coordinates), supply method (e.g., negotiation, sealed bid, two-stage auction, or English auction), land usage type (e.g., residential land, industrial land, or commercial land), names of seller and buyer, industrial classification codes of buyers, etc. Because the Bureau of Land and Resources requires land buyers to report their unique registered names, we consider a land parcel is purchased by the headquarter of a listed firm if the firm's name in the CSMAR database could exactly match the land buyer's name in the land transaction database (see, Wang and Yang, 2021).

The data matching process for subsidiaries and branches of listed firms occurs as follows. We first standardize firm names and subsidiary names from different databases. As in Arora et al. (2021), we omit the legal entity endings and other general words, such as (*gongsi*), company limited (*youxian gongsi*), limited liability company (*youxian zeren gongsi*), corporation (*jituan gongsi* or *jituan youxian gongsi*), holding (*zong gongsi*), bank (*yinhang*), group (*jituan*). For example, the standardized name of *zhongguo shiyou huagong youxian gongsi* (i.e., China Petroleum and Chemical Company Limited) is *zhongguo shiyou huagong* (i.e., China Petroleum and Chemical). We also manually convert commonly used abbreviations to the standardized official name. For example, *zhongguo*

shi hua and *zhong shi hua* are both commonly used abbreviations for *zhongguo shiyou huagong youxian gongsi* (i.e., China Petroleum and Chemical Company Limited).

Second, we consider a land parcel is purchased by the subsidiary or branch of a listed firm if (i) the land buyer's name could exactly match the subsidiary's name, (ii) the land buyer's name contains the firm's name (e.g., China National Petroleum Corporation Jingzhou Petrochemical Complex, China National Petroleum Corporation Lanzhou Retail Company, China National Petroleum Corporation Changzhi Branch are all local branches of the China National Petroleum Corporation), or (iii) the land buyer's name contains the subsidiary's name.

Third, we manually check all pairs with more than one matched firm and pairs with short names (i.e., a firm's name with less than or equal to four Chinese characters) to ensure legitimate matches. We utilize related information, such as industrial classification code, address, and geographic coordinates, to verify whether a local branch (subsidiary) is indeed a match to a land buyer.

Appendix B. Variable definitions and data sources

Variable	Definitions
Dependent variable	
Land Price	Natural logarithm of land price (*yuan* per square meter)
Key independent variables	
Connected	Dummy variable, equals 1 if the land buyer's CEO or board chairperson has political connection, and 0 otherwise
Subsidiary	Dummy variable, equals 1 if the land buyer is a subsidiary or local branch of a listed firm, and 0 otherwise.
Control variables	
Land size	Natural logarithm of land size (square meters)
Listed	Dummy variable, equals 1 if the land buyer is a listed firm, and 0 otherwise.
SOE	Dummy variable, equals 1 if the land buyer (listed firm) is a state-owned enterprise, and 0 otherwise.
Supply	Categorial variable (1 to 4) based on land sales methods: 1 for land parcels sold through negotiations (*xieyi*), 2 for land parcels sold through sealed bid auctions (*zhaobiao*), 3 for land parcels sold through two-stage auctions (*guapai*), and 4 for land parcels sold through English auctions (*paimai*).
Usage	Categorial variable (1 to 6) based on land usage type (Ministry of Housing and Urban-Rural Development of China, 2011): 1 for residential land, 2 for industrial land, 3 for commercial land, 4 for infrastructure land, 5 for public services land, and 6 for other land
Quality	Categorial variable (1 to 18) based on land quality as evaluated by the officials in charge of selling the land. A land parcel with the land quality of 1 has the best location and is close to a city center.
Industry	Categorial variable (1 to 19) based on Industrial Classification for National Economic Activities (GB/T 4754--2017).
Firm size	Category variable (1 to 5) based on firms' revenue (Chen and Kung, 2019): 1 for large firms with annual revenue greater than 0.3 billion *yuan*, 2 for medium-sized firms with annual revenue between 0.3 billion and 30 million *yuan*, 3 for small banks with annual revenue between 30 million and 3 million *yuan*, 4 for micro firm with annual revenue less than 3 million *yuan*, and 5 for firms with missing data.
Instrumental variables	
Distance to Land	Natural logarithm of one plus the distance from a firm's headquarter to the purchased land parcel (km)
Anti-corruption campaign identifier	
Post-2013	Dummy variable, equals 1 on and after 2013, and 0 otherwise

(To be continued…)

(Appendix B continued)

Variable	Definitions
Other variables	
Donations/ Assets	Ratio of expenses on charitable donations over total assets times 100
Subsidies/ Assets	Ratio of government subsidies over total assets times 100
Private sector score	Province-level non-state sector development index from Wang et al. (2017, 2021). A higher score denotes a more developed private sector.
Legal system score	Province-level legal environment index from Wang et al. (2017, 2021). A higher score denotes higher level of law enforcement and social justice.
Variables for firm-level regressions	
% Land expenses through subsidiaries	Ratio of expenses on land acquisition paid by subsidiaries of a listed firm over total expenses on land acquisition by subsidiaries and headquarter of the firm times 100
% Land size through subsidiaries	Ratio of land size purchased by subsidiaries of a listed firm over total land size purchased by subsidiaries and headquarter of the firm times 100
Land expenses/ Assets	Ratio of expenses on land acquisition over total assets times 100
Purchased land size	Natural logarithm of one plus land size purchased (square meters)
Tobin Q	Ratio of book value of equity over market value of equity times 100
Log of assets	Natural logarithm of total assets
Tangible assets/ Assets	Ratio of tangible assets over total assets times 100
Largest ownership	Largest shareholder's ownership (%)
CEO duality	Equals 1 if the CEO and board chairperson are the same person, and 0 otherwise
Board size	Natural logarithm of total number of directors on a firm's board
Ind director/ Board	Ratio of the number of independent directors over total number of directors times 100
Revenue growth	Log changes in sales times 100
ROA	Ratio of earnings before income and tax (EBIT) over total assets times 100
Leverage	Ratio of total liabilities over total assets times 100

Appendix C. Detailed regression results of Table 3

	Log of land price					
	(1)	(2)	(3)	(4)	(5)	(6)
Connected	-0.022	0.097**	-0.019	-0.014	0.009	0.033
	(-0.886)	(2.105)	(-0.332)	(-0.209)	(0.165)	(0.285)
Connected × Subsidiary		-0.128***	-0.113***	-0.107***	-0.141***	-0.258***
		(-2.910)	(-2.915)	(-2.778)	(-3.046)	(-4.371)
Controls						
Land size	-0.026***	-0.026***	-0.046***	-0.043***	-0.031***	-0.018
	(-3.220)	(-3.229)	(-5.340)	(-4.666)	(-3.510)	(-1.169)
SOE	-0.071	-0.069	-0.081	-0.055	-0.059	-0.275***
	(-1.535)	(-1.492)	(-1.447)	(-1.061)	(-0.905)	(-4.040)
Listed	0.172	0.172	1.054***	1.220***	1.179**	0.836**
	(0.757)	(0.754)	(4.383)	(4.908)	(2.447)	(2.495)
Supply = 1, Negotiation	-	-	-	-	-	-
Supply = 2, Sealed bid	0.676***	0.677***	0.883***	0.868***	0.779***	1.044***
	(5.556)	(5.560)	(4.360)	(3.809)	(4.086)	(4.218)
Supply = 3, Two-stage auction	0.559***	0.559***	0.626***	0.623***	0.536***	0.503***
	(6.121)	(6.122)	(5.061)	(4.343)	(4.332)	(3.992)
Supply = 4, English auction	0.934***	0.934***	1.075***	1.077***	0.994***	1.110***
	(8.496)	(8.495)	(7.226)	(6.307)	(7.083)	(7.798)
Industry = 1, Accommodation and catering services	-	-	-	-	-	-
Industry = 2, Agriculture	-0.253***	-0.253***	-0.316***	-0.258***	-0.308***	-1.627***
	(-3.310)	(-3.311)	(-3.490)	(-2.747)	(-3.258)	(-15.104)
Industry = 3, Construction	0.133*	0.134*	-0.084	-0.071	-0.039	-0.895***
	(1.961)	(1.965)	(-1.078)	(-0.811)	(-0.482)	(-7.146)
Industry = 4, Cultural, sports and entertainment services	-0.073	-0.073	-0.265**	-0.289**	-0.230*	-0.289*
	(-1.340)	(-1.338)	(-2.693)	(-2.489)	(-1.977)	(-1.850)
Industry = 5, Education	0.024	0.024	-0.527**	-0.523*	-0.522***	-0.714**
	(0.338)	(0.344)	(-2.355)	(-1.925)	(-2.959)	(-2.705)
Industry = 6, Electricity, gas, and water supply	-0.078	-0.078	-0.152*	-0.094	-0.123	-0.946***
	(-1.268)	(-1.265)	(-2.025)	(-0.985)	(-1.513)	(-10.296)
Industry = 7, Environment and public facilities	0.028	0.028	-0.152	-0.119	-0.102	-0.879***
	(0.470)	(0.477)	(-1.657)	(-1.075)	(-0.960)	(-6.941)
Industry = 8, Financials	0.505***	0.505***	0.480***	0.573***	0.548***	0.602***
	(6.090)	(6.095)	(5.105)	(4.630)	(5.393)	(5.138)
Industry = 9, Health and social services	0.461***	0.461***	0.398***	0.432***	0.471***	-0.091
	(7.456)	(7.468)	(3.822)	(3.506)	(3.615)	(-0.615)
Industry = 10, Leasing and business services	0.318***	0.318***	0.221**	0.245**	0.258**	0.216
	(3.662)	(3.665)	(2.341)	(2.092)	(2.616)	(1.469)
Industry = 11, Manufacturing	-0.119*	-0.119*	-0.241***	-0.197**	-0.198***	-1.380***
	(-2.021)	(-2.023)	(-3.932)	(-2.564)	(-2.866)	(-17.773)
Industry = 12, Mining	-0.105	-0.105	-0.156	-0.123	-0.164	-1.595***
	(-1.268)	(-1.271)	(-1.302)	(-0.894)	(-1.392)	(-8.993)

(To be continued…)

(Appendix C continued)

	Log of land price					
	(1)	(2)	(3)	(4)	(5)	(6)
Industry = 13, Other services	0.028	0.028	-0.070	-0.040	-0.045	-0.512***
	(0.504)	(0.506)	(-1.032)	(-0.466)	(-0.629)	(-4.743)
Industry = 14, Real estate	0.550***	0.550***	0.388***	0.421***	0.465***	0.565***
	(7.903)	(7.907)	(5.248)	(5.064)	(6.419)	(7.036)
Industry = 15, Research and technical services	0.070	0.070	-0.066	0.053	0.013	-0.456***
	(0.995)	(0.999)	(-0.522)	(0.330)	(0.094)	(-2.973)
Industry = 16, Software and information technology services	-0.020	-0.019	-0.060	-0.006	0.004	-1.349***
	(-0.259)	(-0.248)	(-0.536)	(-0.044)	(0.028)	(-8.932)
Industry = 17, Transportation and storage	-0.550***	-0.551***	-0.771***	-0.725***	-0.714***	-1.096***
	(-9.722)	(-9.735)	(-14.638)	(-10.005)	(-12.678)	(-12.936)
Industry = 18, Wholesale and retail trade	0.229***	0.230***	0.097	0.145	0.155*	-0.003
	(3.127)	(3.136)	(1.239)	(1.678)	(1.915)	(-0.040)
Industry = 19, Other	-0.133**	-0.133**	-0.270***	-0.226***	-0.235***	-1.364***
	(-2.115)	(-2.118)	(-4.191)	(-2.982)	(-3.289)	(-18.395)
Firm size =1, Large	-	-	-	-	-	-
Firm size = 2, Medium	-0.244	-0.249	-0.689	-0.749	-0.576	-0.866
	(-1.582)	(-1.615)	(-1.538)	(-1.611)	(-1.644)	(-1.670)
Firm size = 3, Micro	0.209	0.091	-0.037	-0.001	-0.018	-0.946***
	(0.836)	(0.358)	(-0.217)	(-0.008)	(-0.124)	(-5.910)
Firm size = 4, Small	-0.265	-0.265	0.421***	-1.672***	0.631***	1.382***
	(-0.791)	(-0.792)	(3.940)	(-16.983)	(6.214)	(6.433)
Firm size = 5, Unknown	-0.036	-0.037	0.852***	1.001***	0.985**	0.356
	(-0.159)	(-0.161)	(3.736)	(4.339)	(2.043)	(1.232)
Constant	4.690***	4.691***	6.032***	5.668***	3.272***	5.450***
	(14.733)	(14.712)	(21.246)	(19.158)	(5.975)	(11.379)
Sample Matching Method	-	-	≤ 1500M	≤ 500M	≤ 1500M	≤ 1500M
Quality fixed effects	Y	Y	Y	Y	Y	Y
Month fixed effects	Y	Y	Y	Y	Y	Y
City fixed effects	Y	Y	Y	Y	Y	-
Usage fixed effects	Y	Y	Y	Y	Y	-
Year fixed effects	Y	Y	Y	Y	Y	-
City-year fixed effects	Y	Y	Y	Y	-	-
Usage-year fixed effects	Y	Y	Y	Y	-	-
Two-way clustering by firm and province	Y	Y	Y	Y	Y	Y
Observations	904,353	904,353	95,085	73,566	95,085	95,200
Adjusted R-squared	0.619	0.619	0.695	0.709	0.650	0.427