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Hong Ru and Kunru Zou

How do individual politicians affect privatization? Evidence from China

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Contents

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Abstract

This paper investigates how politicians' patronage connections affect privatizations in China. The connections to top political leaders (i.e., Central Committee of the Communist Party of China) make local politicians engage more in rent-seeking by selling state-owned enterprises (SOEs) at substantial discounts. These connected local politicians are also more protected in anti-corruption investigations, thus extracting more rents by selling SOE assets at substantial discounts. Consequently, the privatizations conducted by the local politicians with patronage connections achieve significantly lower gains in efficiency and performance. To identify the role of patronage connection in privatization, we use the mandatory retirement age cut-offs of Central Committee members in the regression discontinuity design. We find drops in price discounts of privatization deals and jumps in efficiency for privatized SOEs when local politicians lose connections to Central Committee members around the retirement age cut-offs.

Keywords: patronage connection, rent-seeking, privatization, China
JEL Classification: D73, G30, L3

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1 Introduction

Political connections play an important role in economies across many countries (e.g., Fisman (2001)).[1] In particular, patronage connections among bureaucrats and politicians set the foundation of political systems in both democratic and autocratic countries (e.g., Grindle (2012); Xu (2019)). However, theoretical arguments on how patronage affects economic performance are ambiguous, and the empirical evidence is limited.[2]

This paper fills this gap in the literature by documenting an underlying channel of how patronage induces corruption and protects local politicians from rent-seeking activities in privatizations and by estimating the consequences on the performance of privatized state-owned enterprises (SOEs). We use data from China, where patronage substantially influences the political and economic systems (e.g., Fisman et al. (2020)), and many SOEs have been privatized in past decades.[3] We find that, in general, privatized SOEs increase efficiency and productivity, while there is vast heterogeneity in efficiency gains following privatization across individual politicians. The local politicians with patronage connections to the top leaders in the Central Committee of the Communist Party of China (CPC) are protected and engage more in rent-seeking in privatizations, which causes worse performance and efficiency of privatized SOEs.

Our findings contribute to the literature examining how patronage affects economic performance. Despite the large body of the literature on political economy, which starts with Nordhaus (1975) and has been growing ever since[4], the evidence on the economic consequences of patronage is scant and ambiguous. On the one hand, patronage empowers discretions in public-sector (e.g., Colonnelli, Prem and Teso (2018); Fisman et al. (2018)) and private-sector (e.g., Bertrand (2009)) appointments, which introduce distortions and inefficiencies in economic activities (e.g., Xu (2018, 2019)). Connections to patrons could disincentivize subordinates, which leads to worse performance (e.g., Prendergast and Topel (1996)). On the other hand, patrons have better private information to evaluate and select better-performed subordinates (Aghion and Tirole (1997)), who are thus incentivized to exert efforts for performance (e.g., Voth and Xu (2020)). The discussion is far from being closed, and the empirical evidence is limited. We add to this on-going discussion by showing that

[1] For example, borrowers with political connections enjoy better credit access (e.g., Johnson and Mitton (2003); Khwaja and Mian (2005); Faccio (2006); Faccio, Masulis and McConnell (2006)).

[2] See detailed discussion in Voth and Xu (2020) for "good" and "bad" patronages in terms of economic implications.

[3] Kowalski et al. (2013) show that over 10% of the world's largest firms are state-owned. China has the highest number of SOEs, especially in strategic industries. Many of them rank among the largest corporations across the globe.

[4] See, for example, MacRae (1977), Kornai (1979), Alesina and Sachs (1988), Shleifer and Vishny (1994), Biais and Perotti (2002), Sapienza (2004), Dinç (2005), Khwaja and Mian (2005), Cohen, Coval and Malloy (2011), Carvalho (2014). Some studies explore how politicians' demographics affect government policies and economic activities (e.g., Levitt (1996); Dollar, Fisman and Gatti (2001); Washington (2008)).

corruption is one of the fundamental channels underlying patronage's detrimental effects on economic performance.

Specifically, in China, the implementation of privatization is decentralized and conducted mainly by local politicians (Xu (2011)). We manually collect data from the curricula vitae of 1,746 leading city politicians (i.e., mayors and city secretaries of the CPC), across 326 cities in China between 1998 and 2009. Accordingly, we obtain firm-level panel data from the Chinese Industry Census (CIC) and restrict the sample to the local SOEs at the city level or below, which are under the direct jurisdiction of those city secretaries. This sample of local SOEs covers 96.7% of the privatization cases in CIC.

Based on those data, we develop the main hypothesis in the paper: when local politicians have strong patronage connections (e.g., connection to top leaders), they enjoy more privileges, such as better protections by their patrons in anti-corruption campaigns (e.g., Zhu and Zhang (2017)). Consequently, these politicians engage in more rent-seeking activities in privatization, which hurts privatized SOEs' performance.

To test this hypothesis, we measure patronage based on local politicians' connections to the Central Committee members of the CPC. The Central Committee is comprised of approximately 200 full member representatives to the National People's Congress, the highest organ of state power. We define local politicians as connected if they have worked as subordinates for Central Committee members.[5] For each local politician, the connections are time-varying due to turnover in the Central Committee. Moreover, for rent-seeking activities, we follow Fisman and Wang (2014) to estimate the value loss amount for negotiated transfer privatization deals. In particular, the value loss amount is equal to the market value of the shares transferred in privatization minus the actual selling price (i.e., negotiated transfer price).

Based on those data, we first document that although privatizations generally increase SOEs' efficiency, the gains are significantly less pronounced when connected local politicians conduct the privatizations. Specifically, consistent with the conventional wisdom, the multivariate analyses show that, on average, privatized SOEs increase their total factor productivity (TFP), return on assets (ROA), operating return on assets (OROA), and total sales by 6.7%, 15.6%, 6.4%, and 18.1%, respectively. However, compared to unconnected local politicians, the improvements in the TFP, ROA, OROA, and total sales of privatized SOEs are reduced by 42.2%, 62.3%, 75.4%, and 20.7%, respectively, for connected local politicians.

The variation in patronage connections is semi-exogenous. Specifically, for individual local politicians, the change in their connections comes from their former bosses' promotions to the

[5] We employ standard approaches in the literature to define connections among politicians (e.g., Jia et al. (2015) and Jiang (2018)). See detailed discussion in Section 2.3.

Central Committee. Additionally, the connections among politicians are predetermined by their past working histories. Thus, the variation in patronage connections is not directly linked to local politicians' concurrent actions. However, these connections could still be correlated with other factors that drive both political connections and privatization outcomes. To identify the role of patronage connections, we employ the fuzzy regression discontinuity design (RDD) by using the compulsory retirement age cut-off for the Central Committee members to explore the discontinuities in local politicians' connections and privatization outcomes. In China, the age limit for term renewal is 64 (68) for Central Committee members at the ministerial (national) level.[6]

In the first stage of fuzzy RDD, consistent with the age limit policy, we find that all Central Committee members step down when they are older than their compulsory retirement ages in turnover years. In the second stage of the fuzzy RDD, we regress the changes in efficiency before and after the privatization on whether the local politicians who conduct the privatization lose connections due to the estimated stepping down of their connected Central Committee members. We find that the efficiency gains of privatizations jump significantly when the local politicians lose their connections. For example, the increases in TFP, ROA, and OROA two years after privatization jump by approximately 31%, 74.9%, and 52.9%, respectively, for local politicians who lose connections due to the stepping down of their connected Central Committee members.

To support the local continuity assumption, we repeat the RDD for other local politicians' characteristics (e.g., age, minority ethnicity, education level, and years in office), and none of them have significant changes around the cut-offs of compulsory retirement ages. This mitigates the concern that other local politicians' characteristics correlate with their political connections and drive the jumps in privatization efficiency gains around the cut-off. In addition, the ratio of privatized SOE numbers over total SOE numbers at the city level does not jump at the cut-off either, which mitigates the concern that the connected politicians might conduct more privatization deals and have to choose ones with potential low-efficiency gains. Consistently, the panel regressions of privatization ratios also show no significant associations with patronage connections. This analysis at the extensive margin rules out a mechanical explanation: connected local politicians tend to conduct more privatizations, which lowers down the average efficiency gain. Overall, these results establish the causal effects of patronage connections on privatization implementations and outcomes. As we specifically indicate, the stepping down of Central Committee members due to the age cut-off is predictable, and our identification comes from the discontinuities rather than exogenous shocks.

[6] In China, the turnover of the Central Committee occurs every five years. The age limit for term renewal of minister-level and national-level Central Committee members are 64 and 68, respectively. This rule of compulsory retirement ages has been strictly enforced without a single exception in our sample period. See a detailed discussion in Section 2.3.

To further support our hypothesis, we examine fundamental channels underlying such heterogeneity in privatization outcomes. First, we test whether the connected local politicians engage in more rent-seeking activities in privatization deals, given that these rent-seeking activities lead to the worse subsequent operating performance for privatized SOEs (Fisman and Wang (2014)). We find that the selling of SOE assets under connected local politicians are deeply discounted from the market value. Consistent with the panel regression, we find that the level of value losses drops by 12.60% when connected local politicians lose patronage connections due to the retirements of the Central Committee members at the age cut-off in the RDD analysis. This RDD results also capture the effects that local politicians foresee the step down of their connected top leaders, and they increase the rent-seeking activities in privatization deals when they still can.

Second, using data of anti-corruption investigations in China, we find that the likelihood of being investigated is significantly lower for connected local politicians. Even under investigation, the connected politicians are protected and receive significantly shorter jail time in sentences, while amounts of corruption are significantly higher for those connected local politicians.

Taken together, our findings support the rent-seeking channel underlying the worse performance of privatized SOEs under connected local politicians. When local politicians' patrons step down, they lose protection from top political leaders and thus engage less in rent-seeking, which leads to better privatization outcomes. Our maintained assumption is that Central Committee members' influence is at least reduced if not altogether lost after retirements. For example, Bertrand et al. (2020) discuss career concerns and motivations of bureaucracies around retirement ages. Retirements significantly reduce bureaucracies' influence. In addition, Jenter and Lewellen (2015) show that, in the private sector, retirements can also influence executives' incentives, such as their preferences in acquisitions.

Besides our contributions to the literature in political economy, this paper also adds to the privatization literature. Although the conventional wisdom has shown that privatization leads to improvements in efficiency (e.g., Boardman and Vining (1989); Megginson, Nash and Van Rrandenborgh (1994); La Porta and Lopez-de-Silanes (1999); Megginson and Netter (2001)), this is not always the case since politics play an important role (e.g., Clarke and Cull (2002); Boehmer, Nash and Netter (2005); Dinç and Gupta (2011)). SOEs can be sold in various ways (e.g., Degeorge et al. (2004)), and the efficiency gains depend largely on the methods of privatization implementations, such as new owners and managers of privatized SOEs (e.g., Barberis et al. (1996); Frydman et al. (1999); Fan, Wong and Zhang (2007); Estrin et al. (2009); Gan, Guo and Xu (2017)). Our findings of heterogeneous outcomes of privatizations across patronage networks shed new light on the mixed evidence of efficiency gains from privatization. One closely related study is by Fisman and Wang (2014), which shows that corruption and rent-seeking in the privatization process are prevalent and

lead to worse subsequent operating performance.[7] This paper complements it by showing that the protection from the patron is underlying those rent-seeking activities.[8]

The rest of this paper is organized as follows. Section 2 describes the institutional backgrounds in China. Section 3 presents the data and summary statistics. Section 4 shows the empirical analysis and results. Section 5 concludes.

2 Background and hypothesis

2.1 History of SOE privatization reform in China

The economic reform opening-up policy in China was started in 1978 by Xiaoping Deng. The privatization of SOEs was one of the most critical parts of the reform, and a major privatization wave started in 1998 under former Prime Minister Rongji Zhu.[9] In China, SOEs have many privileges and resources from their political connections, especially the large ones in strategic industries such as energy, telecommunications, and finance (e.g., China National Petroleum Corporation, China Mobile, and China Telecom). Although most SOEs are inefficient, banks are still more willing to lend to SOEs due mainly to their soft budget constraints.[10] The lousy performance and enormous losses of SOEs have created an enormous burden for the Chinese government, especially in the banking sector. It is the primary reason for this privatization wave.[11]

The primary agenda of this privatization wave is to keep the large SOEs (e.g., central SOEs) untouched while selling small SOEs (e.g., local SOEs) to the private sector. Specifically, in September 1995, the *Ninth Five-Year Plan* and the *2010 Long Range Objectives* were announced in the

[7] Other studies have also shown opposing effects of privatizations in China. Jefferson and Su (2006) show that the conversion of SOEs to shareholding enterprises increase the productivity and innovation efforts in China. Sun and Tong (2003) show that privatizations in China improve the earnings ability but not profit returns.

[8] We also shed light on the puzzle of why incumbent governments want to embrace privatizations. In particular, Shleifer and Vishny (1994) and Boycko, Shleifer and Vishny (1996) argue that governments should have always kept control rights and preferred higher private ownership for higher bribes. However, empirical evidence shows that governments have been giving up both control and cash flow rights across the globe (e.g., Kikeri, Nellis and Shirley (1992); Boycko, Shleifer and Vishny (1993); Megginson (2005)). See detailed discussions in Hu et al. (2019).

[9] The first privatization attempts took place from 1978 to 1984, and SOEs started to pay taxes instead of giving their profits directly to the government. This change failed to incentivize SOEs since the tax rate was too high (around 55%), and many SOEs were unable to pay. The second attempt took place from 1984 to 1998. During this period, SOEs contracted out some of their businesses to private sectors. However, most contractors extracted as much rent as possible, which harmed the SOEs and state assets.

[10] For detailed discussions of banks' preference regarding SOEs due to their soft budget constraints, which lead to credit misallocation in China, see, for example, Qian and Roland (1998), Lin and Tan (1999), Cull and Xu (2003), Song and Xiong (2018).

[11] Yao (2005) uses a survey data of 800 SOEs from 1995 to 2001 and finds that insolvency was a big problem facing many SOEs, and government and state banks did not want to support these firms anymore. Privatization became the most plausible way out of this problem. There were more than 40 thousand SOEs privatized or re-organized by 1998. Xu (2011) documents that the total loss of SOEs in 1998 was approximately RMB 307 billion in China, which is about 3.7% of annual GDP loss.

Fifth Plenary Session of the Fourteenth Central Committee. This plan focused on economic transformation, especially the SOE reform, with the key slogan of "grasp the large and let go of the small".[12] Shares of SOEs are sold in various ways (e.g., sales to private owners, public offerings, joint ventures, leasing). For example, the original purpose of establishing the stock market in China was to fund SOEs. In the CIC data, SOEs controlled approximately 66.27% of the assets in 1998, which dropped to 23.79% in 2009.

During this privatization wave, in addition to the central government, local governments play a key or even a more prominent role in the entire process. In China, each SOE has a rank in the political hierarchy and is under the control of different levels of the State-owned Assets Supervision and Administration Commission (SASAC). For example, municipal-level SOEs are owned by the city-level SASAC and need to give their profits to local municipal governments. Moreover, each SOE has a committee in the CPC, mainly comprised of the SOE's executive management team (e.g., Chairman and CEO). These people serve as government officials who are accordingly attached to the local governments. In short, local governments and local politicians play a significant role in the progress of privatization. In other words, the implementations of privatization are decentralized and are mainly determined by local politicians (e.g., Xu (2011); Gan, Guo and Xu (2017)).

2.2 Hypothesis development

In China, factionalism and clientelism play important roles in political and economic systems (e.g., Meyer, Shih and Lee (2016); Huang, Li, Ma and Qian (2017); Fisman et al. (2018)). The main focus of our study is on the role of local politicians' patronage connections in privatization performance. It is a long debate in the literature on whether patronage connections are good or bad for performance. On the one hand, patronage could hurt economic performances due mainly to distorted appointments in governments. For example, Grindle (2012) documents that patronage increases corruption in appointments of public officials. We hypothesize a particular channel of the detrimental effects of patronage on privatization outcomes in China via rent-seeking.

> **Hypothesis**: When local politicians have strong patronage connections (e.g., connection to top leaders), they are more protected in the system. Consequently, these politicians engage in more rent-seeking activities in privatization, which hurts privatized SOEs' performance.

[12] See the detailed document of the Ninth Five-Year Plan and the 2010 Long Range Objectives at http://www.gov.cn/test/2008-04/21/content_950407.htm. Additionally, Hsieh and Song (2015) described the institutional background of the state sector transformation and found that the government retained control of the large SOEs while privatizing the smaller ones.

More specifically, the literature has shown that connections to the top leaders in China give local politicians more privileges (e.g., Shih, Adolph and Liu (2012)). For example, the connected local politicians are more protected from anti-corruption campaigns (e.g., Zhu and Zhang (2017)). These lead to more corruption activities during the privatization processes. The corruption activities are detrimental for the performance of privatized SOEs since the efficiency gain from privatizations could be erased by rent-seeking activities, which are value-destroying (e.g., Fisman and Wang (2014)).

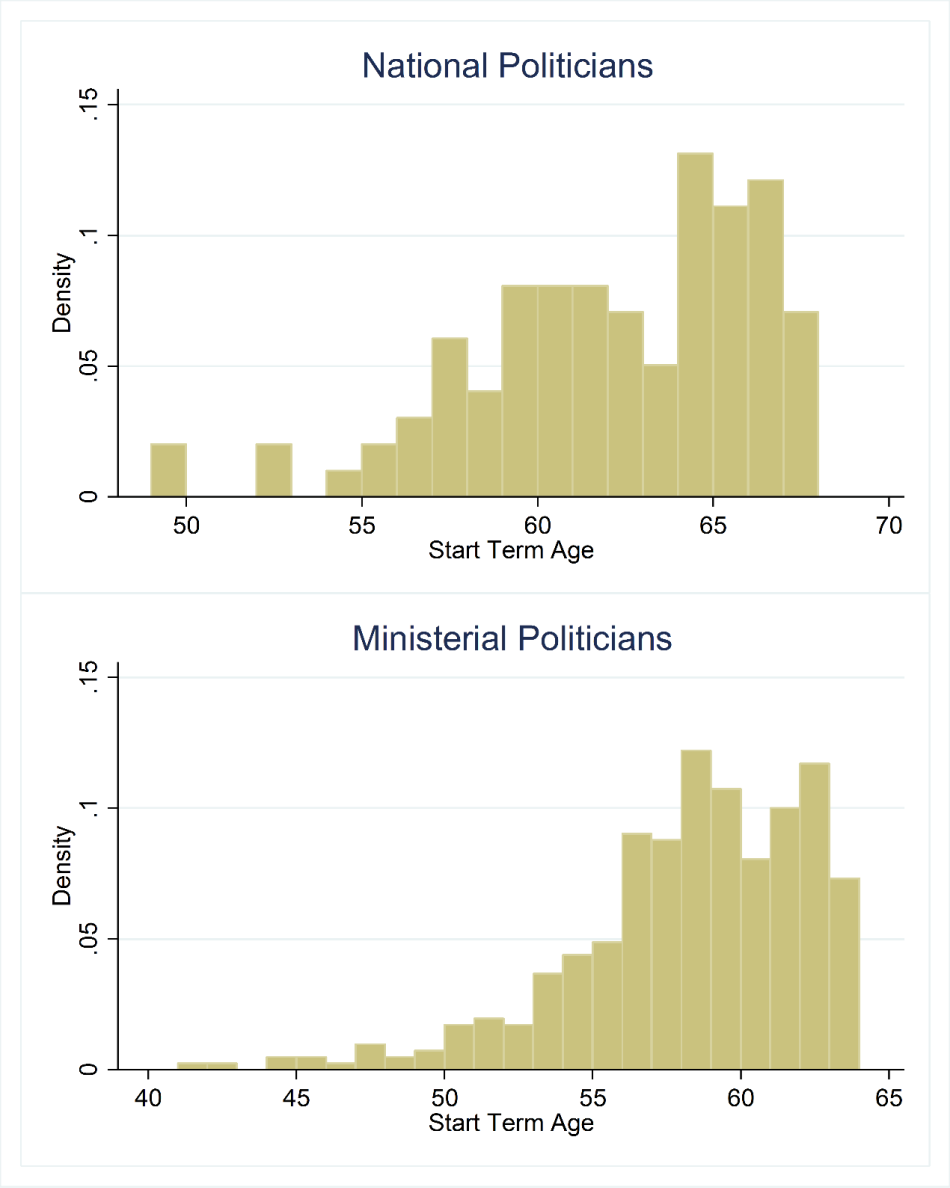
2.3 Politician patronage connections and retirement age cut-offs

To formally test our hypothesis, we explore the variation in connections to top political leaders across individual city politicians. In particular, a city politician is considered powerful and has a strong political background if she is connected to Central Committee members. The Constitution of the CPC states that the National Congress (i.e., Party Congress) is the highest organ of state power, and the Central Committee is the leading body. The Central Committee members vote and elect the most prominent politicians in China, such as the general secretary (e.g., President Xi Jinping), the members of the Politburo, and the members of the Central Military Commissions. Moreover, the members of the Central Committee usually hold high ranking government and party positions, such chief provincial leaders, ministerial politicians of the State Council, and commanders of military-regional level organizations. The Central Committee has approximately 200 full members and 150 alternate members in recent terms (i.e., from the 15th to the 18th Central Committees), and each term lasts five years. Alternate members fill empty seats on the Central Committee according to the number of votes by which they were elected.

We define a city secretary or mayor as connected if she has worked as a subordinate for at least one member of the Central Committee. For example, the connection between the city politician A (junior politician) and the Central Committee member B (senior politician) is formed when the junior politician A served as subordinate to senior politician B. Moreover, following Jia et al. (2015), the junior politician's rank should be within two levels below the senior politician to make sure that they indeed work together. To further reduce measurement errors, we restrict the senior politicians to provincial and city secretaries who are the top politicians in the province and city with the discretions to appoint their subordinates and require that the junior politician begins in her position after the senior politician begins in hers (Jiang (2018)). In other words, when a senior politician selects or promotes certain junior politicians to work for her, they are closely connected. In China,

it is common for provincial and city secretaries to pick certain junior politicians as their subordinates.13 We identify such connections using 26,482 observations of working experience of 1,746 city politicians. For each junior politician, the connections are time-varying, depending on the changes in Central Committee members over time; Central Committee members are elected every five years. The connection comes into effect when the senior politician became the Central Committee member. The connection expires when the senior politician steps down as a Central Committee member.

Figure 1 Start term age distribution



This figure presents the age distribution of Central Committee members at different levels in term 16th to term 18th. We focus on politicians who are not in the military track. The top panel plots start term age distribution for national-level politicians. The bottom panel is for minister-level politicians. The horizontal axis represents the start term age, and the vertical axis represents the density of the age groups. Start term age is politician's age at the election date.

[13] For example, if city secretary A and her subordinate B worked in the same city, we define the two as connected. When A becomes a member of the Central Committee, and B becomes a city secretary, we consider B has patronage connections to the Central Committee members.

For promotion to the Central Committee, age is one of the most crucial factors. Specifically, the members of the Central Committee are generally at the ministerial level, such as ministers and provincial secretaries. There is a strict compulsory retirement age for minister-level provincial politicians in China. According to "*Leading Cadres Retirement Provision*", minister-level politicians cannot renew their term if they are 64 years old or older.[14] Moreover, the Politburo of the Central Committee has approximately 25 members who are ranked at the national level, and their age limit for term renewal is 68 years old. To be precise, national (ministerial) politicians such as provincial secretaries cannot renew their Central Committee membership if they are 68 (64) years old or older in the year of turnover. Figure 1 plots the distribution of start-term ages for Central Committee members at the ministerial and the national levels in our sample period, respectively. We find no single exception to this policy that is strictly enforced.

3 Data and summary statistics

We utilize two datasets for our empirical analyses. The first one is the firm-level data for privatizations. The second one is the hand-collected politician profile dataset.

3.1 Firm-level privatization data

The first dataset we use in this paper is the Chinese Industrial Census (CIC) collected by the Chinese National Bureau of Statistics (NBS). It covers all the manufacturing firms in China, with annual sales of more than USD 700 thousand between 1998 and 2009. This period captures the entire privatization wave under Prime Minister Rongji Zhu from 1998 to 2005 and several years after the wave, which allows us to study the privatization decisions and subsequent outcomes. The data record yearly accounting statements (e.g., balance sheet, income statement, and cash flow statement) as well as other firm characteristics (e.g., number of workers, industry classification, physical location, registration type, political hierarchy, government subsidy, wages, and shareholders) for each firm. In total, we have 706,976 firms, which comprised about 40% of industrial output in China. To our knowledge, CIC is the most detailed database on Chinese manufacturing firms with comprehensive information and sufficient quality.

We use two methods to classify the SOEs and private firms in the CIC. First, we use the firm registration type and define a firm as SOE if it is owned by a government department or collective-owned based on the official NBS classification. For each SOE, we can trace the changes in its registration types over time to identify the privatization timing. Since we are examining how

[14] See the detailed document at http://cpc.people.com.cn/GB/64162/71380/102565/182144/10994167.html

city leaders affect privatization, we focus on firms that are not subject to the central or provincial government. We exclude firms that cannot be matched to sub-provincial or prefectural cities and have non-consecutive records due to missing observations. There are 113,682 SOEs in the sample, and 28,411 of them are privatized. Second, we use the shareholders' information to classify SOEs vs. private firms. In particular, CIC data disclose the shareholdings by five types of owners: state ownership, collective ownership, individual ownership, corporation ownership, and foreign ownership. We calculate the percentage of state ownership by combining the first two. This captures the dynamics of privatizations for individual SOEs since there are many partial privatizations in China (i.e., the state sells part of the SOEs to the private sector, and it usually takes several sales to fully privatize a SOE.)

Moreover, we then obtain the transaction-level data on negotiated transfer deals for listed SOEs from China Center for Economic Research (CCER) Database. This dataset contains details of all negotiated transfer deals from February 1995 to December 2019. For each deal, the data record the date when the transaction was first announced, transferred price, the number of shares transferred, names and identities of the seller and the buyer, the name and stock code of the company whose shares were to be transferred. We download the financial information of those listed SOEs from CSMAR, such as total assets, leverage, ROA, and stock turnover. To be consistent with the CIC sample period, we keep the negotiated transfer deals up to December 2009. Following Fisman and Wang (2014), we calculate the value loss amount as the market value of the shares transferred in privatization minus the actual selling price (i.e., value loss amount = (market trading price - actual selling price)×total shares transferred). To capture rent-seeking activities, we exclude deals that are not finished up to now or have negative value losses from the sample.

3.2 Politician profile data

The second data record the politician profiles in mainland China from 1998 to 2009. It covers all the mayors and secretaries of CPC across 326 cities in China and all the provincial governors and secretaries for 32 provinces in China. We get the name list and the biographic information of these politicians from the China Stock Market & Accounting Research (CSMAR) Database. However, the quality of politicians' profiles might vary among different cities, especially for small ones. We cross-validate the data using information from CSMAR and Baidu Encyclopedia. Specifically, we manually search for politicians' curriculum vitae (CV) from the Baidu Encyclopedia, a Chinese-language collaborative web-based encyclopedia provided by the Chinese search engine Baidu. Baidu Encyclopedia is the top Chinese online encyclopedia and generally offers extensive backgrounds of famous people (e.g., politicians).

This profile dataset covers 1,746 leading city politicians (i.e., mayors and city secretaries of the CPC). Each CV records the politician's gender, age, history of education, place of birth, work experience. Moreover, in China, it is common for people to have the same name. We double-check the politicians who have the same name and give them unique IDs. We obtain the complete working histories of politicians from their CVs and complements our data by the Chinese Political Elite Database (Jiang, 2018). Moreover, the data also record the anti-corruption consequences for local politicians. Specifically, for individual politicians, we know whether they have been under investigations in anti-corruption campaigns, and the outcomes of their investigations (e.g., convictions, corruption amounts, including bribes received and political graft, and punishments, such as demotions, length of jail sentences, and death sentences).

We merge the firm and politician data. In particular, the CIC records an 11-digit number that can locate a firm at the street level. We cut the first four digits to identify the city and use it to match city politicians at the city level.[15] Moreover, the CIC data record firms' ranks in the political hierarchy so that we can observe whether a firm is under the jurisdiction of the central government, provincial governments, city governments, or below.

As discussed in Section 2.1, the main goal of the privatization wave is to sell the small local SOEs while keeping the large SOEs (e.g., central SOEs) state-owned (i.e., "grasp the large and let go of the small"). Consistent with this policy, in the CIC data, there are only 1,189 privatizations for central and provincial SOEs, while 34,846 SOEs at the city level or below have been privatized between 1998 and 2009. In other words, 96.7% of privatization cases are from SOEs at the city level or below. In total, RMB 3,656 billion SOE assets have been privatized, and around two-thirds of them are from local SOEs at the city level or below from 1998 to 2009. Over this period, the total assets of central and provincial SOEs increased from RMB 3,800 billion to RMB 8,309 billion, while the total assets of local SOEs decreased from RMB 3,404 billion to RMB 2,418 billion. Our study mainly focuses on the role of city politicians, and we restrict the sample to the SOEs at the city level or below, which covers most privatization activities in China.

3.3 Summary statistics

Figure A.1 shows the time trend of the privatization wave in China. The left panel shows the number of privatized SOEs over time. Consistent with the privatization agenda, the major wave of privatization is during the early 2000s. After 2005, the pace has been slowing down. The right panel shows the total assets privatized each year and have similar patterns as the number of privatized SOEs. In

[15] In total, we have 326 cities in the sample. We exclude Beijing, Tianjin, Shanghai, and Chongqing, which are province-level municipalities under the direct control of the state council. These four cities are classified as provinces.

Figure A.2, we listed the percentages of SOEs that have been privatized across industries. Most of the privatization activities concentrate on strategic industries such as energy, chemical, and mining. The textile industry was also heavily targeted by the privatization wave.

Table I is the summary statistics of the main variables in the regression sample in this paper. Panel A is for CIC data. In total, there are 706,976 individual firms in CIC data from 1998 to 2009. To investigate how city politicians affect privatization, we restrict the sample to city-level SOE (i.e., exclude SOEs owned by central or provincial governments). We further restrict the sample to the firms that first appeared in our database as an SOE and drop firms that have non-consecutive records over the years. Firms located in the four province-level municipalities are excluded (e.g., Beijing, Shanghai, Tianjin, and Chongqing). Our sample has 507,446 firm-year observations. The dummy *Private* is for whether the SOEs have changed the registration types from state-owned to privately owned. This is the primary variable we use to measure privatization progress.[16] On average, 22.5% of the SOEs have been privatized between 1998 and 2009. We also use the variable $Private\ Share$ to measure privatization progress, which is the percentage of private ownership of SOEs. On average, 33.8% of the shares are sold to private sectors. Moreover, for our main efficient measurements, the average TFP, ROA, and $OROA$ are 1.421, 5.294, and 10.291, respectively. In particular, we calculate the TFP following Cobb-Douglas form, which is the residual in the regression of the log(total revenue) against log(total assets) and log(total employment) in the panel of firms in the CIC survey from 1998 to 2009.

Table I Panel B is for politician data at the city-year level. In China, the secretary of CPC is the top politician in cities, and we focus on them in the analyses. There are 3,706 observations with 1,048 unique city secretaries over 326 cities from 1998 to 2009. On average, the age of city secretaries is approximately 51.2. 97.9% of them are male, and 53.5% of them have obtained master's degrees or above. Moreover, 7.6% of them have minority ethnicities (i.e., other than Han). The mean of *Connection* is 0.593, which means that 59.3% of the city secretaries are connected to at least one Central Committee member. The mean of *Connection#* is 0.659 with the maximum value of 4. This means that city secretaries can be connected to at most 4 Central Committee members.

Panel C is for negotiated transfer deals for listed SOEs' privatizations. Our sample has 1,673 deals across 536 SOEs. 72.3% of deals were sold to private-owned enterprises. On average, each deal transferred 13% of the total share outstanding. Moreover, on average, RMB 208 million are lost per deal, and 71.8% of total values are lost throughout our sample.

[16] There are few cases where the registration types of privatized SOEs revert to state-owned and then become private-owned again. The reverse of the privatization in China is documented in Huang et al. (2017). We use the last change from state-owned to private-owned as the privatization time. For robustness check, we use the first change, and the results are similar.

Table I Summary statistics

Variable	Mean	Observations	S.D.	P25	Median	P75
Panel A: CIC sample						
Private	0.225	507446	0.418	0	0	0
Private Share	0.338	467015	0.448	0	0	1
TFP	1.421	495876	1.339	0.737	1.582	2.297
ROA	5.294	497223	15.562	–0.047	0.911	6.150
OROA	10.291	497299	17.838	0.962	3.744	10.670
Log(Sale)	8.932	506242	3.464	8.570	9.463	10.496
MktShare	0.017	506242	0.164	0.001	0.003	0.010
Log(Asset)	9.342	506246	2.671	8.563	9.506	10.564
Panel B: Politician sample						
Connection	0.593	3706	0.491	0	1	1
Connection#	0.659	3706	0.603	0	1	1
Age	51.171	3598	4.076	48	51	54
Gender	0.979	3706	0.142	1	1	1
Minority	0.076	3706	0.265	0	0	0
Tenure	3.090	3705	1.736	2	3	4
Education	0.535	3706	0.499	0	1	1
FiscalExpense	52.461	3691	69.458	16.290	30.800	62.590
FiscalRevenue	30.350	3687	58.504	6.660	13.120	29.310
Panel C: Negotiated transfer deals sample						
ValueLossAmount	18.388	1652	1.395	17.552	18.538	19.356
PrivateBuyer	0.723	1673	0.448	0	1	1
FractionTransfered	0.130	1673	0.119	0.046	0.091	0.187
TurnOver	1.832	1652	1.273	0.878	1.547	2.456
Log(Asset)	20.480	1652	0.897	19.927	20.452	20.937
Leverage	0.249	1647	0.189	0.134	0.230	0.335
ROA	–0.005	1652	0.193	0.005	0.031	0.057

This table describes the summary statistics of our sample. Panel A provides the summary statistics of CIC datasets from 1998 to 2009. Firm year panel data are restricted to firms that are not subject to central or provincial governments and that first appeared in our database as a state-owned enterprise Firms without available prefecture-level or sub-provincial-level city identifier are excluded. Firms located in the four municipalities are excluded (e.g., Beijing, Shanghai, Tianjin, and Chongqing), and cities not covered by our politician datasets are also dropped. In total, there are 113,682 unique firms in the sample, with 507,448 observations across 326 cities. *TFP, ROA, OROA* are winsorized at 1% at both ends. Panel B provides the summary statistics of prefecture-level or sub-provincial-level city secretary data, which is a city-year panel. City secretary data covers 1,048 unique city secretaries across from 1998 to 2009. Panel C reports the summary statistics for the 1,673 negotiated transfer deals across 536 stocks. See Table A.1 for detailed variable definitions.

4 Empirical analysis and results

4.1 Privatization outcomes and individual politicians

We start the empirical analyses by looking at the privatization outcomes, especially the heterogeneity across local politicians. In particular, we restrict the sample to firms that have been state-owned and perform the OLS regressions of SOE activities and several performance measurements on privatization progress. Formally, the regression can be expressed as follows:

$$Y_{i,t} = \alpha + \beta \times Private_{i,t} + \gamma \times Control_{i,t} + \eta_i + \zeta_t + \varepsilon_{i,t}, \quad (1)$$

where $Y_{i,t}$ represents the measurements of the efficiency of firm i in year t, such as TFP, ROA, $OROA$, and other firm activities such as sales and market share. $Control_{i,t}$ represents firms' characteristics, such as total sales or total assets. The main variable of interest is the dummy $Private_{i,t}$, which represents whether firm *i* is registered as a private firm or not in year *t*. In other words, when $Private_{i,t}$ changes from zero to one in year *t*, the SOE is privatized in that year. We control for firm fixed effects to use the variation within the firm and control for year fixed effects to condition out the macro time trend. The sample is a panel at the firm×year level, and the standard errors are clustered at the firm level.

Table II Panel A shows the regression results. From columns (1) to (5), the coefficients of *Private* are all significantly positive, suggesting that privatized SOEs increase their efficiency and business activities. For example, for TFP in column (1), the coefficient of *Private* is 0.067 at the 1% significance level, which means that the TFP of SOEs increases by 6.7%. We also find the significant positive coefficients of *Private* in columns (2) and (3) for ROA and $OROA$, respectively, suggesting that the gains from privatization are robust across measurements of firm efficiency. Moreover, the coefficients of *Private* in columns (4) and (5) for $Log(Sales)$ and $MktShare$ are also significantly positive. Therefore, the performance of privatized SOEs also improves significantly, which is consistent with the efficiency gains shown in columns (1) to (3). In Panel B, instead of dummy *Private*, we use $Private\ Share$ as the independent variable, which is the percentage of shares owned by the private sector. Consistent with Panel A, the coefficients of $Private\ Share$ have significantly positive coefficients on TFP, ROA, $OROA$, $Log(Sales)$, and $MktShare$. Overall, these findings suggest that, as in many other countries, privatization improves SOEs' efficiency and performance in China.

Table II Privatization consequence

Panel A: Registration type					
Variables	(1) TFP	(2) ROA	(3) OROA	(4) LogSale	(5) MktShare
Private	0.067***	0.828***	0.656***	0.181***	0.004***
	(0.005)	(0.077)	(0.094)	(0.009)	(0.001)
Controls	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	495,876	497,218	497,294	506,227	506,227
Adj. R-squared	0.068	0.039	0.052	0.384	0.001
Panel B: Private ownership					
Variables	(1) TFP	(2) ROA	(3) OROA	(4) LogSale	(5) MktShare
Private Share	0.082***	0.749***	0.558***	0.167***	0.003***
	(0.004)	(0.071)	(0.088)	(0.008)	(0.001)
Controls	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	462,052	466,784	466,863	467,014	467,014
Adj. R-squared	0.069	0.035	0.050	0.088	0.001

This table presents the results of OLS panel regressions on privatization consequences. The panel is from 1998 to 2009, and the sample is restricted to local SOEs at the city level or below. In Panel A, the main independent variable, *Private*, is a dummy that takes the value of one if the firm is concurrently registered as a private firm. In Panel B, the main independent variable *Private Share* is the share of ownership that is not owned by the state. *Log(Sales)* are controlled in columns of *ROA* and *OROA*. *Log(Asset)* is controlled in the rest columns. Firm and year fixed effects are controlled in each column. See Table A.1 for detailed variable definitions. Standard errors are clustered at the firm level and reported in parenthesis. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Next, we explore the heterogeneity in the outcomes of privatizations across individual local politicians. As discussed in Section 2.1, the implementation of privatizations is decentralized in China. As top politicians in cities, city secretaries are influential so that we focus on the effects of city secretaries' patronage connections on privatization outcomes.[17] To formally test it, we interact the dummy $Private$ with the dummy $Connection$ in the panel regressions, as in Table II, where $Connection$ is the dummy for whether the privatization is in the city where the city secretary is concurrently connected to full Central Committee members. Since firm fixed effects are controlled in all regressions, the time-invariant $Connection$ is thus subsumed. Table III shows the results. Consistent with Table II, the dummy *Private* has significantly positive coefficients on TFP, ROA, $OROA$, $Log(Sales)$, and $MktShare$. Moreover, in column (1) of Panel A, the coefficient of $Private \times Connection$ is –0.038 and is significant at the 1% level, suggesting that the efficiency

[17] In unreported results, we include city mayors' patronage connections and find similar results.

gain in TFP after privatization is significantly less if a connected city secretary conducts the privatization deal. On average, the improvement in the TFP of privatized SOEs under unconnected city secretaries is 9.0%, while the increase in TFP is only 5.2% under connected secretaries, which is equivalent to an approximately 42.22% decrease in efficiency gains. In columns (2) and (3) of Panel A, the coefficients of $Connection \times Private$ are –0.828 and –0.908, respectively, and are both significant at the 1% level. This means that the efficiency gains of ROA and $OROA$ after privatization are significantly lower if a connected city secretary conducts the privatization. In Panel B, we interact the dummy $Private$ with $Connection\#$, and the results are similar to those in Panel A.

Table III Political connection and privatization consequence

Panel A: Connection dummy					
Variables	(1) TFP	(2) ROA	(3) OROA	(4) LogSale	(5) MktShare
Private	0.090***	1.328***	1.204***	0.208***	0.004**
	(0.007)	(0.129)	(0.155)	(0.012)	(0.002)
Connection × *Private*	–0.038***	–0.828***	–0.908***	–0.043***	–0.001
	(0.009)	(0.160)	(0.195)	(0.013)	(0.002)
Controls	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	495,876	497,218	497,294	506,227	506,227
Adj. R-squared	0.068	0.039	0.052	0.384	0.001
Panel B: Number of connections					
Variables	(1) TFP	(2) ROA	(3) OROA	(4) LogSale	(5) MktShare
Private	0.089***	1.267***	1.166***	0.204***	0.004**
	(0.007)	(0.119)	(0.143)	(0.011)	(0.002)
Connection# × *Private*	–0.031***	–0.622***	–0.723***	–0.032***	–0.001
	(0.007)	(0.118)	(0.144)	(0.010)	(0.002)
Controls	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	495,876	497,218	497,294	506,227	506,227
Adj. R-squared	0.068	0.039	0.052	0.384	0.001

This table presents the results of OLS panel regressions of privatization outcomes implemented by connected politicians versus unconnected politicians. The sample is from 1998 to 2009 and is restricted to local SOEs at the city level or below. *Connection* is a dummy variable that takes the value of one if the firm is privatized by a city secretary who is concurrently connected with at least one full Central Committee members in the year of privatization. *Connection#* counts the number of contemporaneous connections that the city secretary has with Central Committee members in the year of privatization. *Private* is a dummy variable that takes the value of one if the firm is concurrently registered as a private firm. *Log(Sales)* are controlled in columns of *ROA* and *OROA*. *Log(Asset)* is controlled in the rest columns. Firm and year fixed effects are controlled in each column. Time-invariant *Connection* (*Connection#*) is subsumed by the firm fixed effects. See Table A.1 for detailed variable definitions. Standard errors are clustered at the firm level and reported in parenthesis. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

The literature has pointed out the issues in measuring TFP (e.g., Beveren (2012), Imrohoroglu and Tuzel (2014)). As a robustness check, we use various measurements of TFP and repeat the analyses. In particular, we recalculate TFP in two ways: 1) controlling industry and year fixed effects; 2) using the value-added amount as the dependent variable. The results are in Table A.2 in the Internet Appendix, which are similar to Table III: the TFP generally increases for privatized SOEs, but significantly less so for the deals conducted by connected politicians.

Additionally, we run the cross-sectional regressions of changes in SOE performance before and after the privatization on the city secretary's political connections. Consistent with Table III, we find that privatizations implemented by connected city secretaries are significantly worse than those implemented by unconnected city secretaries. In Appendix Table A.3, we calculate ΔTFP, ΔROA, $\Delta OROA$, one year before and after the privatization in columns (1) to (3). In Panel A, the coefficients on $Connection$ are negative at the 1% significance level. The results still hold if we expand the window to two years of average change before and after privatization in columns (4) to (6). Again, we find similar results for $Connection\#$ in Panel B.

In summary, we find suggestive evidence in Table III that although privatization is associated with efficiency increases on average, these benefits of privatization are less pronounced when local politicians with connections to top leaders conduct the privatization. Consistent with Xu (2011), our findings suggest that privatization implementations are decentralized in China, and local politicians play an important role in the process.

4.2 Regression discontinuity design

In Table III, we use the variation in the local politician's connections, which is time-varying. A city secretary can be considered as connected if a senior official to which she is connected is elected as a member of the Central Committee, while she might also lose the connection if the connected senior politician steps down. The connection between a local politician and a senior politician is based on their previous work experience. This variation is semi-exogeneous since the variation in connections is not directly related to the city leader's concurrent action. However, this approach does not entirely rule out other factors that could drive both the city leaders' connections and privatization outcomes. For example, the connected local politicians could be assigned to more developed cities with relatively more efficient SOEs than the unconnected politicians, which explains the lower efficiency gains of the privatizations conducted by the connected local politicians.

To identify the causal effect of patronage connection on privatization outcomes, we use the mandatory retirement age cut-off for members in the Central Committee to explore the discontinuities in local politicians' connections and privatization outcomes in the setting of fuzzy regression

discontinuity design (RDD). As discussed in Section 2.3, the age limit for Central Committee member appointments is strictly enforced. In particular, the age limit for term renewal for a national (ministerial) politician is 68 (64) years old.

Based on those the compulsory retirement cut-off ages, we employ a fuzzy RDD since even if a politician is younger than the retirement age, the term renewal is not guaranteed. Formally, the RDD regressions can be expressed as follows:

$$LosePower_{it} = \beta_{0r} + \beta_{1r} \times Distance_{it} + D_{it}[\beta_{0l} + \beta_{1l} \times Distance_{it}] + \varepsilon_{it} \quad (2)$$

$$Y_{jit} = \beta_{0r} + \beta_{1r} \times Distance_{it} + \widehat{LosePower}_{it}[\beta_{0l} + \beta_{1l} \times Distance_{it}] + \varepsilon_{it}, \quad (3)$$

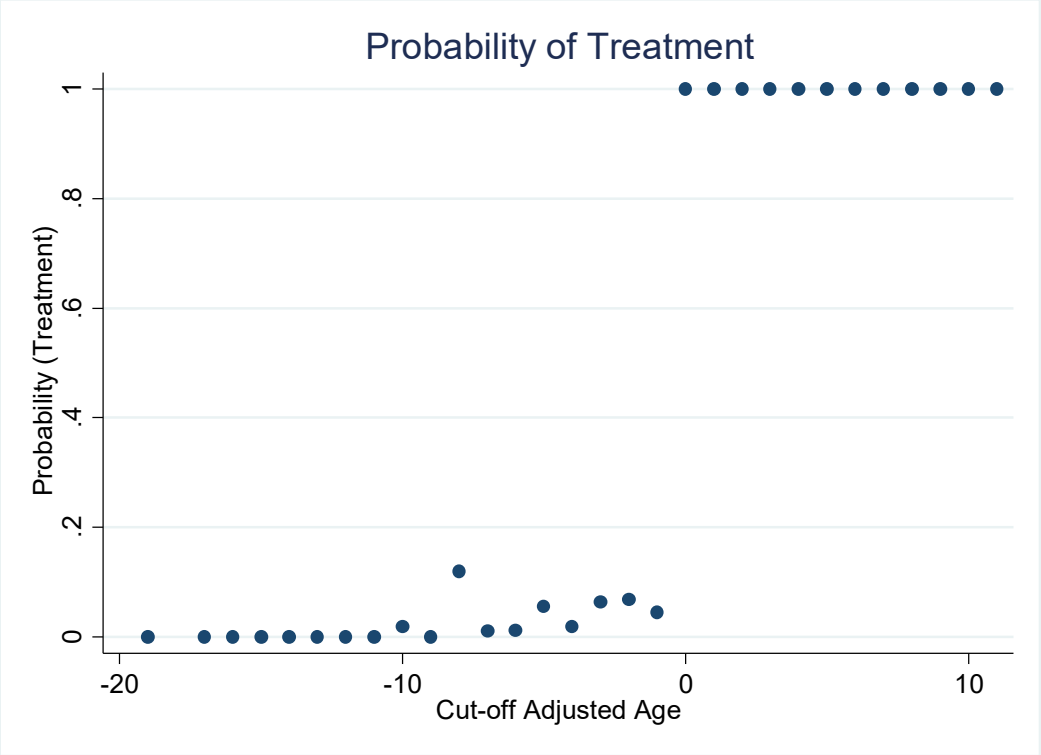
where Equation (2) illustrates the first stage in the fuzzy RDD, and Equation (3) illustrates the second stage. The outcome variables Y_{jit} is the change in various efficiency measurements (i.e., ΔTFP_2, ΔROA_2, and $\Delta OROA\_2$) following the privatization of firm *j*, which is privatized in year *t* by city secretary *i*. The regression is cross-sectional at the firm level, and we restrict it to privatizations conducted by city secretaries who were ever-connected with Central Committee members. For independent variables, $\widehat{LosePower}_{it}$is estimated from the first stage outcome variable $LosePower_{it}$, which is a dummy that is equal to one if city secretary *i* is connected to a senior politician who has stepped down in year *t* when firm *j* is privatized. $Distance_{it}$ is the difference between city secretary *i*'s connected senior politician's start term age and the cut-off age.[18] For example, when city secretary *i*'s connected senior politician serves in the Central Committee in year *t*, the senior minister-level (national-level) politician's age when she started this term must be below 64 (68), and $Distance_{it}$ is negative. In contrast, when city secretary *i*'s connected senior politician does not serve in the Central Committee at the year *t*, the senior politician's age when she started the term might be higher than or equal to the cut-off age (has stepped down from the Central Committee), and $Distance_{it}$ is positive. D_{it} is a dummy variable that takes the value of one if $Distance_{it}$ is positive and zero for negative $Distance_{it}$. The coefficients β with subscripts *r* and *l* stand for estimations on data exclusively to the right and left of the cut-off age, respectively.

Figure 2 plots the probability of treatment (i.e., step-down) around the age cut-offs. We show that around the age cut-off, which is zero in the horizontal axis in Figure 2, top politicians' stepping down (i.e., treatment) probability jumps from almost 0 to 1. This is consistent with Figure 1, which shows that none of the minister-level (national-level) Central Committee members could renew another term when they are older than or equal to 64 (68) years old in the turnover year. Moreover, the probability of stepping down is not precisely zero for young politicians since they

[18] When calculating the distance, we minus the senior politician's start term age by their retirement age cut-offs (i.e., 64 for minister-level politicians and 68 for national-level politicians).

might not renew their term for other reasons, such as being investigated by anti-corruption campaigns.

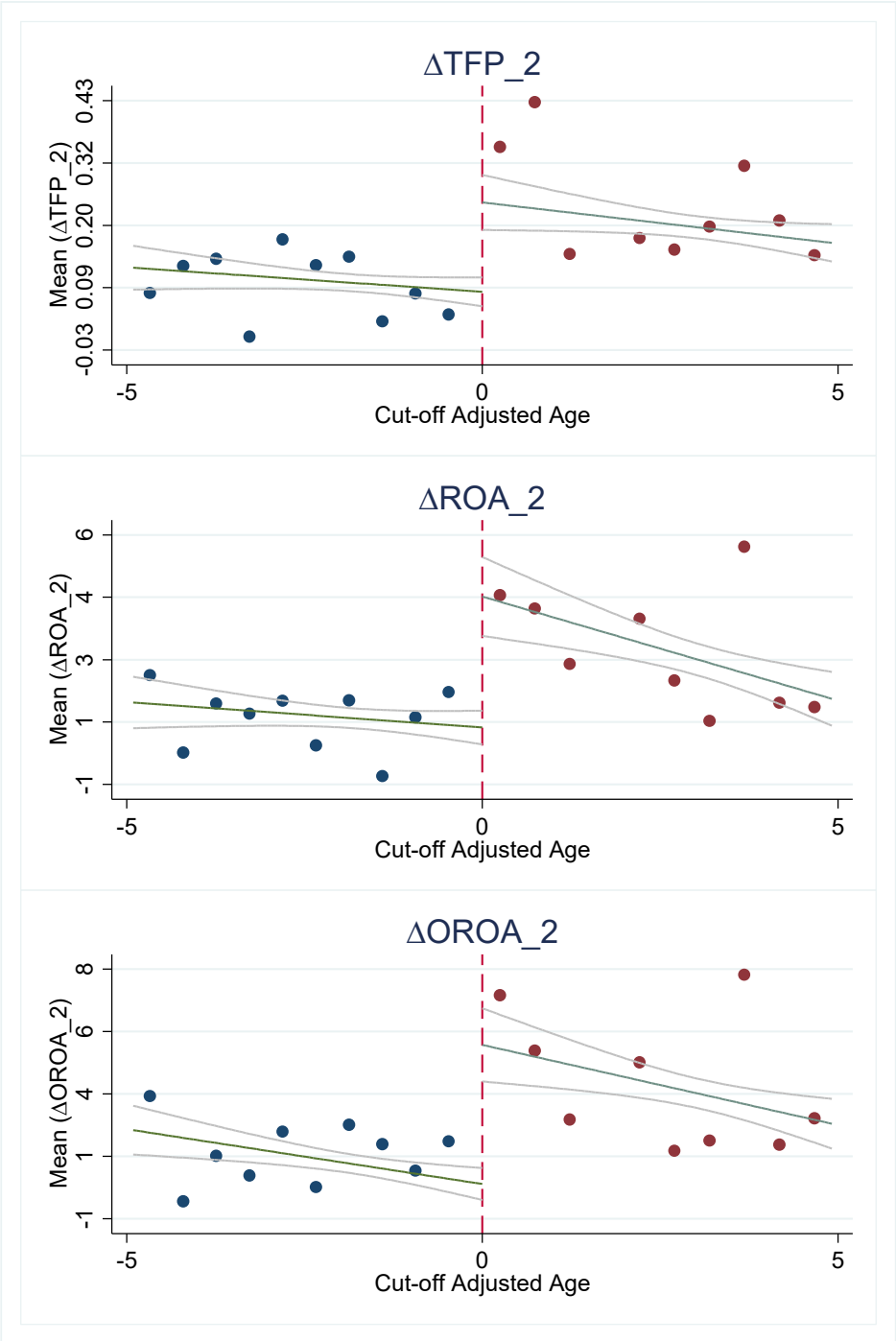
Figure 2 Probability of treatment



This figure shows the first-stage fuzzy RDD plot of treatment probability against cut-off adjusted age (age minus retirement cut-off ages, which is 64 for minister-level politicians and 68 for national-level politicians). The vertical axis shows the probability of treatment (i.e., step down) across age groups of Central Committee members. In the horizontal axis, to the right of 0 (including 0) are Central Committee members whose age at the time of term renewal is larger than or equal to the retirement cut-off age. To the left of 0 (excluding 0) are the Central Committee members whose age at the time of term renewal is below cut-off age.

In Figure 3, we plot the privatization outcomes against the distance of connected senior politicians' start-term ages to their age cut-offs (point zero in the horizontal axis). In particular, we plot the changes in TFP, ROA, and $OROA$ two years before and after privatization (i.e., ΔTFP_2, ΔROA_2, and $\Delta OROA\_2$). We find significant jumps in TFP gains following privatization at the cut-off when the local politician's connected Central Committee members step down due to the age limit. In Figure 3, we also plot the 95% confidence intervals of the linear best fits for the observations in the right and left sides of the cut-offs, respectively. The 95% confidence intervals for the right and left sides do not overlap at zero, which means that the jumps in TFP gains following privatization at the cut-offs are statistically significant. Furthermore, we find similar jumps for ROA and OROA at the cut-off, which further strengthens our identifications.

Figure 3 Privatization consequence



This figure shows the graphical results of the RDD on the privatization consequences (i.e., TPF, ROA, and OROA). The vertical axis denotes the firm's privatization outcomes, as in Table IV. In the horizontal axis, to the left (right) of the cut-off are the firms that are privatized by city secretaries who are connected to the Central Committee members with ages lower (higher) than the mandatory renewable age (i.e., 64 for minister-level politicians and 68 for national-level politicians). 95% confidence intervals are drawn around the linear best fit.

In addition to the unconditional patterns in Figure 3, we employ the fuzzy RDD to run the nonparametric local linear regression as in Equations (2) and (3). Table IV reports the conventional estimation and the bias-corrected estimation by Calonico, Cattaneo, and Titiunik (2015). Consistent with Figure 3, in column (1), the local Wald estimators are 0.306 and 0.319 at the 5% significance

level for the conventional estimation and the bias-corrected estimation, respectively. This suggests that the average improvement in TFP two years before and after privatization jumps by approximately 31% if the city secretary is connected to a senior politician who is just above the age of retirement and has stepped down from the Central Committee. Column (2) shows the average improvement in ROA two years before and after privatization. The local Wald estimators are 3.969 and 3.880 at the 5% significance level for the conventional estimation and the bias-corrected estimation, respectively. In column (3), we use the average improvements in $OROA$ two years before and after privatization, and the conventional local Wald estimators are 5.447 and 5.657 at the 10% significance levels, respectively. For robustness checks, we repeat the RDD regressions with 100%, 200%, and 300% optimal bandwidth, respectively, following Imbens and Kalyanaraman (2012) and find similar significant jumps in Table A.4.

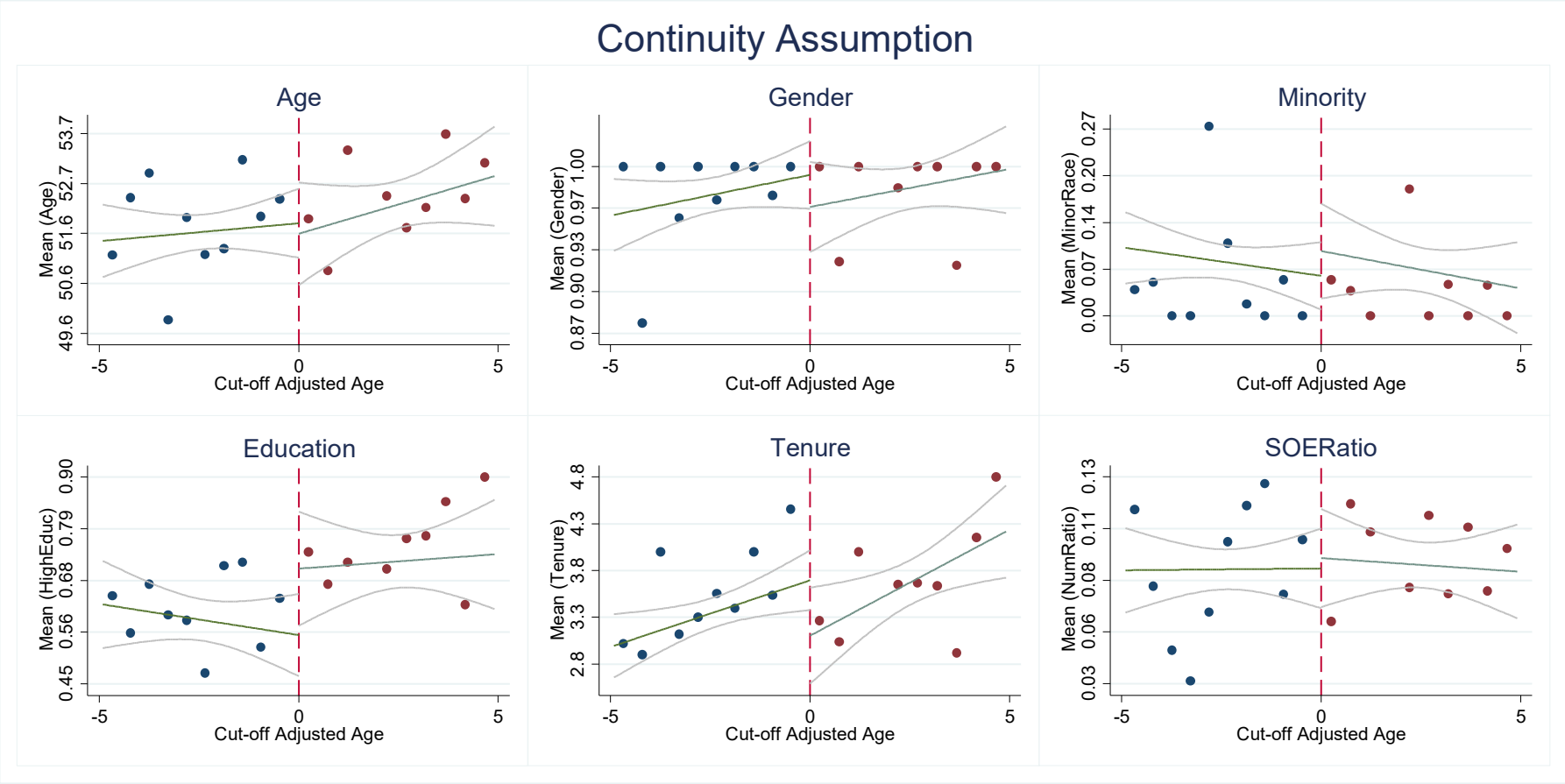
Table IV Regression discontinuity design

	(1)	(2)	(3)
Variables	ΔTFP_2	ΔROA_2	$\Delta OROA\_2$
Conventional	0.306**	3.969**	5.447*
	(0.139)	(1.940)	(3.269)
Bias-corrected	0.319**	3.880**	5.657*
	(0.139)	(1.940)	(3.269)
Observations	14,469	14,657	14,665

This table reports firm-level regression results from the fuzzy regression discontinuity design. The sample is restricted to firms that are privatized by city secretaries who have ever connected with Central Committee members. On both sides around the age cut-off, we use the Mean Square Error optimal bandwidth following Calonico, Cattaneo, and Titiunik (2014). Triangular kernel is used in the local linear regression. Two treatment effect estimators are reported: conventional local Wald estimator and bias-corrected estimator proposed by Calonico, Cattaneo, and Titiunik (2015). The assignment variable is distance between the connected Central Committee's start term age and the age cut-off. The treatment variable is a dummy that takes the value of 1 if the connected Central Committee member has completed his final term. The outcome variable is the privatization outcomes at the firm level. *ΔTFP_2*, *ΔROA_2*, and *ΔOROA_2* are the average annual changes in *TFP*, *ROA*, and *OROA* two years before and after the privatization, respectively. See Table A.1 for detailed variable definitions. Standard errors clustered at the local politician level are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

The stepping down of Central Committee members due to the age cut-off is predictable. Specifically, our identification in the RDD approach comes from discontinuities rather than exogenous shocks. The key identification assumption is local continuity. In particular, local continuity requires that all factors other than the treatment variable vary continuously at the age cut-off. In Figure 4, we plot several politician characteristics, such as local politicians' Age, $Gender$, $Minority$, $Education$, and $Tenure$ against the distance of their connected senior politician's start term age to the age cut-off. In all the graphs, we do not find any significant jumps around the cut-offs. This suggests that the privatization performance jumps documented in Table IV are not driven by the city secretary's personal characteristics other than the connection.

Figure 4 Continuity assumption



This figure presents the graphical check on the local continuity assumption of the regression discontinuity design. In the horizontal axis, to the left (right) of the cut-off are characteristics of city secretaries who are connected to Central Committee members with ages lower (higher) than the mandatory retirement age (i.e., 64 for minister-level politicians and 68 for national-level politicians), such as *Age*, *Gender*, *Minority*, *Education*, and *Tenure*. We also plot the privatization activity (i.e., *SOERatio*) in the city. Detailed variable descriptions are in Table V. 95% confidence intervals are drawn around the linear best fit.

Moreover, we also plot the ratio of privatized SOE numbers over total SOE numbers ($SOERatio$) at the city level against the start term age of the Central Committee members connected to the city secretaries. This mitigates the concern that the connected local politicians might have smaller pools of SOEs to pick from for privatization and have to choose SOEs with low-efficiency gains. Consistently, Table A.5 in the Internet Appendix shows the results for the panel regressions of privatization ratios on patronage connections. There is no significant association between the two. This analysis at the extensive margin rules out a mechanical explanation: connected local politicians tend to conduct more privatizations, which lowers down the average efficiency gain.

Furthermore, we repeat the RDD regressions of these other factors (i.e., Age, $Gender$, $Minority$, $Education$, $Tenure$, and $SOERatio$) in Table V. The conventional estimation and the bias-corrected estimation by Calonico, Cattaneo and Titiunik (2015) are used in the regressions. Consistent with Figure 4, none of the coefficients are statistically significant under the conventional estimation and biased-corrected estimation.

Table V Regression discontinuity design (continuity assumption)

Variables	(1) *Age*	(2) *Gender*	(3) *Minority*	(4) *Education*	(5) *Tenure*	(6) *SOERatio*
Conventional	–0.431	–0.027	0.040	0.146	–0.578	–0.030
	(0.866)	(0.030)	(0.076)	(0.105)	(0.381)	(0.027)
Bias-corrected	–0.415	–0.027	0.053	0.142	–0.622	–0.038
	(0.866)	(0.030)	(0.076)	(0.105)	(0.381)	(0.027)
Observations	1,486	1,508	1,508	1,508	1,508	1,507

This table reports city secretary×term level results from the fuzzy regression discontinuity for the personal characteristics and privatization activity. The sample is restricted to city leaders who have ever connected with Central Committee members. On both sides around the age cut-off, we use the Mean Square Error optimal bandwidth following Calonico, Cattaneo, and Titiunik (2014). Triangular kernel is used in the local linear regression. Two treatment effect estimators are reported: conventional local Wald estimator and bias-corrected estimator proposed by Calonico, Cattaneo, and Titiunik (2015). The assignment variable is cut-off adjusted age, which is the connected Central Committee's start term age minus the age cut-off. The treatment variable is a dummy that takes the value of 1 if the connected Central Committee member has completed his final term. The outcome variables are the personal characteristics and the privatization activity in the city, which is governed by the city secretary. *Age* is the local politician's age at the end of the Central Committee term. *Gender* is a dummy variable that takes the value of 1 if the local politician is male, 0 otherwise. *Minority* is a dummy variable that takes the value of 1 if the politician's ethnicity is non-Han, 0 otherwise. *Education* is a dummy variable that equals 1 if the politician's highest educational achievement is higher than or equal to master's degree. *Tenure* counts the number of years the local politician has served in this term by the end of the Central Committee term. *SOERatio* is the ratio of the number of firms privatized over the total number of SOEs in this city. Standard errors clustered at the local politician level are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

In summary, we establish the causal effects of local politicians' patronage connections on privatization outcomes. In particular, patronage connections to powerful senior politicians in the Central Committee lead to worse efficiency gains following privatization. Consistently, when local politicians lose connections to top political leaders, they conduct privatizations with better outcomes.

4.3 Rent-seeking underlying worse privatization outcomes

In the sections above, we show that local politicians with patronage connections conduct privatizations with worse outcomes. In this section, we aim to understand the fundamental reasons underlying these worse privatization outcomes. Specifically, in Section 2.2, we hypothesize that connected local politicians are protected and thus engage more in rent-seeking in privatization, which leads to worse efficiencies of privatized SOEs.

4.3.1 Value loss in privatizations

Fisman and Wang (2014) show that the stealing from selling SOE assets at a discounted price is prevalent in China's privatizations, and this rent-seeking behavior leads to the worse subsequent operating performance of privatized SOEs. We follow their approach and calculate the discounts for each privatization deal, as described in Section 3.1.

In particular, we perform the regression of the natural logarithm of value loss amounts (i.e., variable $ValueLossAmount$) on patronage connections for a subsample of 1,537 privatization deals for listed firms in China and report the results in Table VI. In columns (1) to (3), the coefficients of dummy $Connection$ are all significantly positive. These estimates suggest that patronage connections are positively associated with the value losses in the selling of SOE assets in privatizations. For example, the coefficient on $Connection$ in column (1) is 0.236 at the 5% significance level, suggesting that the discounts in SOE assets selling are 23.6% deeper under connected local politicians than unconnected politicians. Patronage connections encourage local politicians to extract more rents (i.e., higher amounts of value losses) from privatization deals. In columns (4) to (6), the coefficients on $Connection\#$ are also significantly positive. We control for multiple deal-level characteristics, such as $PrivateBuyer$, $FractionTransferred$, $TurnOver$, $Log(Asset)$, $Leverage$, and ROA.

In addition, we repeat the RDD and perform the regressions of value loss in Panel B. Consistent with OLS regression results, the local Wald estimators are –2.316 and –2.477 for the conventional estimation and the bias-corrected estimation, respectively. This suggests that the level of value losses drops by 12.60% (2.316/18.388) when connected local politicians lose their patronage connections due to the retirements of the Central Committee members at the age cut-off. As we stated above, local politicians can foresee the step down of their connected top leaders due to the retirement age caps. Consequently, they could engage in more rent-seeking activities by selling SOE assets at deeper discounts when they still can, which is captured by the RDD results in Table VI.

Table VI Political connection and rent-seeking

Panel A: OLS regression						
Variables	(1) *ValueLoss Amount*	(2) *ValueLoss Amount*	(3) *ValueLoss Amount*	(4) *ValueLoss Amount*	(5) *ValueLoss Amount*	(6) *ValueLoss Amount*
Connection	0.236**	0.200*	0.314*			
	(0.112)	(0.117)	(0.169)			
Connection#				0.304***	0.269***	0.333***
				(0.098)	(0.096)	(0.122)
Controls	YES	YES	YES	YES	YES	YES
Politician FE	YES	YES	YES	YES	YES	YES
City FE	YES	YES	NO	YES	YES	NO
Industry FE	NO	YES	NO	NO	YES	NO
Firm FE	NO	NO	YES	NO	NO	YES
Observations	1,537	1,534	1,389	1,537	1,534	1,389
Adj. R-Squared	0.639	0.669	0.773	0.640	0.671	0.774

Panel B: Regression discontinuity	
Variables	(1) *ValueLoss Amount*
Conventional	–2.316**
	(0.985)
Bias-corrected	–2.477***
	(0.985)
Observations	568

This table reports results from OLS regression and regression discontinuity of value loss amount in negotiated transfer deals implemented by connected politicians versus unconnected politicians. The sample is restricted to deals with positive value loss. Panel A is a deal-level regression with *ValueLossAmount* as the dependent variable. *ValueLossAmount* is the natural logarithm of the value loss amount in the negotiated transfer deal, where the value loss amount is calculated by the average price (mean of opening and closing price) on the announcement day times number of shares transferred times the discount to the average price. *Connection* is a dummy variable that takes the value of one if the city secretary is concurrently connected with at least one full Central Committee members. *Connection#* counts the number of contemporaneous connections that the city secretary has with Central Committee members. *PrivateBuyer*, *FractionTransferred*, *TurnOver*, *Log(Asset)*, *Leverage*, and *ROA* were controlled in each column. Panel B is a city×year level regression on the value loss amount with the regression discontinuity design. We restrict the sample to deals conducted by city secretaries who are ever connected with Central Committee members. We use the Mean Square Error optimal bandwidth on both sides around the age cut-off following Calonico, Cattaneo, and Titiunik (2014). Triangular kernel is used in the local linear regression. Two treatment effect estimators are reported: conventional local Wald estimator and bias-corrected estimator proposed by Calonico, Cattaneo, and Titiunik (2015). The assignment variable is distance between the connected Central Committee's start term age and the age cut-off. The treatment variable is a dummy that takes the value of 1 if the connected Central Committee member has completed his final term. The outcome variable is the *ValueLossAmount* aggregated at the city level. Robust standard errors are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

In summary, the results in Table VI suggest that corruption activities are more severe in the privatizations conducted by the local politicians with patronage connections to the top political leaders. Corruption serves as a fundamental channel underlying the worse economic performance induced by patronage.

4.3.2 Protections from patronage

To further understand how patronage encourages rent-seeking activities, we explore the protection effects of patronage connections. In particular, we obtain the data for the anti-corruption investigation cases in China and collect the information on the corruption amount and punishment of each anti-corruption investigation of city leaders. In Table VII, we perform the cox proportional duration regression of investigation probability for local politicians. In columns (1) to (4), the coefficients on $Connection$ and $Connection\#$ are all significantly negative. This suggests that the patronage connections are associated with lower likelihoods of investigations under anti-corruption campaigns. In other words, the connected local politicians are protected by their senior politicians in the Central Committee.

Table VII Political connection and investigation

Variables	(1) *Investigation*	(2) *Investigation*	(3) *Investigation*	(4) *Investigation*
Connection	–0.317**		–0.420**	
	(0.161)		(0.178)	
Connection#		–0.330***		–0.425***
		(0.116)		(0.131)
Controls	YES	YES	YES	YES
Province FE	NO	NO	YES	YES
Observations	14,192	14,192	14,192	14,192
Chi-squared	22.310	24.980	64.070	66.870
Pseudo R-squared	0.012	0.013	0.033	0.035

This table presents the results of the Cox proportional duration regression of investigation probability of connected versus unconnected politicians. This sample covers politicians who served as city secretaries and mayors from 1998 to 2009. For each politician, the sample is extended five years after she ends a term as a city leader to incorporate the subsequent investigation after ending her term as a city politician. The origin and failure event are the years when the local politician first appeared in our dataset and the year in which the local politician gets investigated, respectively. *Connection* is a dummy variable that takes the value of one if the city politician is concurrently connected with at least one full Central Committee member. *Connection#* counts the number of concurrent connections that the city politician has with Central Committee members. Politician characteristics (i.e., *Age*, *Gender*, *Education*, *Minority*), city characteristics (i.e., the natural logarithm of GDP) are controlled in all columns. Province fixed effects are further controlled in columns (2) and (4). Robust standard errors are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

In addition, in Table VIII, we regress the corruption amount reported in the investigation records on local politicians' patronage connections. In columns (1) to (4), the coefficients of $Connection$ and $Connection\#$ are all significantly positive. For example, in column (3), the coefficient on $Connection$ is 0.546 at the 10% significance level, suggesting that the amount of corruption is 54.6% higher for connected local politicians than unconnected ones. This suggests that connected local politicians use their political power to do more corruption activities and extract more rents.

Table VIII Political connection and corruption

Variables	(1) *Corruption*	(2) *Corruption*	(3) *Corruption*	(4) *Corruption*	(5) *Ln(Sentence/ Corruption)*	(6) *Ln(Sentence/ Corruption)*	(7) *Ln(Sentence/ Corruption)*	(8) *Ln(Sentence/ Corruption)*
Connection	0.637*		0.546*		-0.805**		-0.679**	
	(1.911)		(1.768)		(-2.382)		(-2.173)	
Connection#		0.429***		0.326**		-0.486***		-0.367**
		(2.682)		(2.159)		(-2.991)		(-2.435)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Province FE	NO	NO	YES	YES	NO	NO	YES	YES
Observations	124	124	124	124	119	119	119	119
Adj. R-squared	0.085	0.096	0.196	0.199	0.112	0.119	0.213	0.213

This table presents the results of the OLS cross-sectional regression of corruption amount and investigation consequence of connected versus unconnected politicians. This sample covers politicians who served as city secretaries and mayors from 1998 to 2009 and subsequently got investigated and sentenced. *Corruption* is the natural logarithm of the corruption amount of the investigated politician. Corruption amount is the sum of bribes received and political graft. *Log(Sentence/Corruption)* is the natural logarithm of the ratio between the number of years sentenced and the corruption amount. For politicians that got sentenced with suspended death penalty and life imprisonment, 20 is given for the number of years sentenced. *Connection* is a dummy variable that takes the value of one if the city politician is ever connected with at least one full Central Committee member from 1998 to 2009. *Connection#* counts the maximum number of connections that the city politician has with Central Committee members from 1998 to 2009. Time invariant politician characteristics (i.e., *Gender*, *Minority*), city characteristics (i.e., the natural logarithm of the average GDP in cities led by the politician) are controlled in all columns. Province fixed effects are further controlled in column (3), (4), (7), and (8). Robust standard errors are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Furthermore, in columns (5) to (8), we perform regressions on the punishments received after the anti-corruption investigations. The outcome variable is the number of years sentenced in jail normalized by the total amount of corruption (i.e., $Log\ (Sentence/Corruption)$). The coefficients of $Connection$ and $Connection\#$ are all significantly negative. For example, in column (7), the coefficient on $Connection$ is –0.679 at the 5% significance level, suggesting that the normalized length in jail is 67.9% lower for connected local politicians than unconnected ones.

In summary, these findings in Table VIII suggest that the patronage provides protections to local politicians in the anti-corruption campaign. This protection empowers the local politicians and encourages them to engage in more rent-seeking activities, as shown in Table VI.

5 Conclusion

This study examines the role of politicians in privatization outcomes in the context of China. For the first time, we show that patronage connection is essential for the efficiency gains from privatization. This leads to vast heterogeneity in outcomes of privatizations. In particular, patrons (i.e., Central Committee members) protect their clients (i.e., local politicians) from anti-corruption investigations, thus encouraging clients' rent-seeking activities in privatization deals. This hurts the ex-post performance of the privatized SOEs.

Patronage is widespread not only in China but also in many other countries across the globe. Our findings shed new light on the debate about patronage's impacts on economic performance. Our implication is beyond privatization since corruption is prevalent in many other areas in the society (e.g., Shleifer and Vishny (1993)), and patronage is one of the fundamental drives for corruption.

References

Aghion, Philippe, and Tirole, Jean, 1997. Formal and real authority in organizations. Journal of Political Economy, 105(1): 1–29.

Alesina, Alberto, and Sachs, Jeffrey, 1988. Political parties and the business cycle in the United States, 1948–1984. Journal of Money, Credit and Banking, 20(1): 63–82.

Barberis, Nicholas, Boycko, Maxim, Shleifer, Andrei, and Tsukanova, Natalia, 1996. How does privatization work? Evidence from the Russian shops. Journal of Political Economy, 104(4):764–90.

Bertrand, Marianne, 2009. CEOs. Annual Review of Economics, 1(1): 121–150.

Bertrand, Marianne, Burgess, Robins, Chawla, Arunish, and Xu, Guo, 2020. The glittering prizes: Career incentives and bureaucrat performance. The Review of Economic Studies, 87(2): 626–655.

Biais, Bruno, and Perotti, Enrico, 2002. Machiavellian privatization. American Economic Review, 92(1):240–58.

Boardman, Anthony E., and Vining, Aidan R., 1989. Ownership and performance in competitive environments: A comparison of the performance of private, mixed, and state-owned enterprises. The Journal of Law and Economics, 32(1): 1–33.

Boehmer, Ekkehart, Nash, Robert C., and Netter, Jeffry M., 2005. Bank privatization in developing and developed countries: Cross-sectional evidence on the impact of economic and political factors. Journal of Banking and Finance, 29(8): 1981–2013.

Boycko, Maxim, Shleifer, Andrei, and Vishny, Robert W., 1993. Privatizing Russia. Brookings Papers on Economic Activity, 1993(2): 139–192.

Boycko, Maxim, Shleifer, Andrei, and Vishny, Robert W., 1996. A theory of privatization. The Economic Journal, 106(435): 309–319.

Calonico, Sebastian, Cattaneo, Matias D., and Titiunik, Rocio, 2014. Robust nonparametric confidence intervals for regression-discontinuity designs. Econometrica: Journal of the Econometric Society, 82(6): 2295–2326.

Calonico, Sebastian, Cattaneo, Matias D., and Titiunik, Rocio, 2015. Optimal data-driven regression discontinuity plots. Journal of the American Statistical Association, 110(512): 1753–69.

Carvalho, Daniel, 2014. The real effects of government-owned banks: Evidence from an emerging market. The Journal of Finance, 69(2): 577–609.

Clarke, George R.G., and Cull, Robert, 2002. Political and economic determinants of the likelihood of privatizing Argentine public banks. The Journal of Law and Economics, 45(1): 165–197

Cohen, Lauren, Coval, Joshua, and Malloy, Christopher, 2011. Do powerful politicians cause corporate downsizing? Journal of Political Economy, 119(6): 1015–1060.

Colonnelli, Emanuele, Prem, Mounu, and Teso, Edoardo, 2018. Patronage and selection in public sector organizations. Working Paper.

Cull, Robert, and Xu, Lixin Colin, 2003. Who gets credit? The behavior of bureaucrats and state banks in allocating credit to Chinese state-owned enterprises. Journal of Development Economics, 71(2): 533–559.

Degeorge, François, Jenter, Dirk, Moel, Alberto, and Tufano, Peter, 2004. Selling company shares to reluctant employees: France Telecom's experience. Journal of Financial Economics, 71(1): 169–202.

Dinç, I. Serdar, 2005. Politicians and banks: Political influences on government-owned banks in emerging markets. Journal of Financial Economics, 77(2): 453–479.

Dinç, I. Serdar, and Gupta, Nandini, 2011. The decision to privatize: Finance and politics. The Journal of Finance, 66(1): 241–69.

Dollar, David, Fisman, Raymond, and Gatti, Roberta, 2001. Are women really the "fairer" sex? Corruption and women in government. Journal of Economic Behavior and Organization, 46(4): 423–429.

Estrin, Saul, Hanousek, Jan, Kočenda, Evžen, and Svejnar, Jan, 2009. Effects of privatization and ownership in transition economies. Journal of Economic Literature, 47(3): 699–728.

Faccio, Mara, 2006. Politically connected firms. American Economic Review, 96(1): 369–386.

Faccio, Mara, Masulis, Ronald W., and McConnell, John J., 2006. Political connections and corporate bailouts. The Journal of Finance, 61(6): 2597–2635.

Fan, Joseph P. H., Wong, T. J., and Zhang, Tianyu, 2007. Politically connected CEOs, corporate governance, and post-IPO performance of China's newly partially privatized firms. Journal of Financial Economics, 84(2): 330–357.

Fisman, Raymond, 2001. Estimating the value of political connections. American Economic Review, 91(4): 1095–1102.

Fisman, Raymond, and Wang, Yongxiang, 2014. Corruption in Chinese privatizations. The Journal of Law, Economics, and Organization, 31(1): 1–29.

Fisman, Raymond, Shi, Jing, Wang, Yongxiang, and Xu, Rong, 2018. Social ties and favoritism in Chinese Science. Journal of Political Economy, 126(3): 1134–1171.

Fisman, Raymond, Shi, Jing, Wang, Yongxiang, and Wu, Weixing, 2020. Social ties and the selection of China's political elite. American Economic Review, 110(6): 1752–1781.

Frydman, Roman, Gray, Cheryl, Hessel, Marek, and Rapaczynski, Andrzej, 1999. When does privatization work? The impact of private ownership on corporate performance in transition economies. The Quarterly Journal of Economics, 114(4): 1153–1191.

Gan, Jie, Guo, Yan, and Xu, Chenggang 2017. Decentralized privatization and change of control rights in China. The Review of Financial Studies, 31(10): 3854–3894.

Grindle, Merilee, 2012. Jobs for the Boys: Patronage and the State in Comparative Perspective. Harvard University Press.

Hsieh, Chang-Tai, and Song, Zheng Michael, 2015. Grasp the large, let go of the small. Brookings Papers in Economic Activity, 2015(2): 295–346.

Hu, Qing, Li, Wenjing, Lin, Chen, and Wei, Lai, 2019. What causes privatization? Evidence from import competition. Working Paper.

Huang, Zhengkai, Li, Lixing, and Ma, Guangrong, and Qian, Jun, 2017. The reversal of privatization: Determinants and consequences. Working paper.

Imbens, Guido, and Kalyanaraman, Karthik, 2012. Optimal bandwidth choice for the regression discontinuity estimator. The Review of Economic Studies, 79(3): 939–959.

Jefferson, Gary H., and Su, Jian, 2006. Privatization and restructuring in China: Evidence from shareholding ownership, 1995–2001. Journal of Comparative Economics, 34(1):146–66.

Jenter, Dirk, and Lewellen, Katharina, 2015. CEO preferences and acquisitions. The Journal of Finance, 70(6): 2813–2852.

Jia, Ruixue, Kudamatsu, Masayuki, and Seim, David, 2015. Political Selection in China: The complementary roles of connections and performance. Journal of the European Economic Association, 13(4): 631–668.

Jiang, Junyan, 2018. Making bureaucracy work: Patronage networks, performance incentives, and economic development in China. American Journal of Political Science, 62(4): 982–999.

Johnson, Simon, and Mitton, Todd, 2003. Cronyism and capital controls: Evidence from Malaysia. Journal of Financial Economics, 67(2): 351–382.

Khwaja, Asim Ijaz, and Mian, Atif, 2005. Do lenders favor politically connected firms? Rent provision in an emerging financial market. The Quarterly Journal of Economics, 120(4): 1371–1411.

Kikeri, Sunita, Nellis, John, and Shirley, Mary, 1992. Privatization: The lessons of experience. The World Bank.

Kornai, J., 1979. Resource-constrained versus demand-constrained systems, Econometrica: Journal of the Econometric Society, 47(4): 801–819.

Kowalski, Przemyslaw, Büge, Max, Sztajerowska, Monika, and Egeland, Matias, 2013. State-owned enterprises: Trade effects and policy implications. OECD Trade Policy Papers, No. 147, OECD Publishing.

La Porta, Rafael, and Lopez-de-Silanes, Florencio, 1999. The benefits of privatization: Evidence from Mexico. The Quarterly Journal of Economics, 114(4): 1193–1242.

Levitt, Steven D., 1996. How do senators vote? Disentangling the role of voter preferences, party affiliation, and senator ideology. American Economic Review, 86(3): 425–441.

Lin, Justin Yifu, and Tan, Guofu, 1999. Policy burdens, accountability, and the soft budget constraint. American Economic Review, 89(2): 426–431.

MacRae, C. Duncan, 1977. A political model of the business cycle. Journal of Political Economy, 85(2): 239–263.

Megginson, William L., Nash, Robert C., and Van Raldenborgh, Matthias, 1994. The Financial and operating performance of newly privatized firms: An international empirical analysis. The Journal of Finance, 49(2): 403–452.

Megginson, William L., and Netter, Jeffry M., 2001. From state to market: A survey of empirical studies on privatization. Journal of Economic Literature, 39(2): 321–389.

Megginson, William L., 2005. The financial economics of privatization. New York: Oxford University Press.

Meyer, David, Shih, Victor C., and Lee, Jonghyuk, 2016. Factions of different stripes: Gauging the recruitment logics of factions in the reform period. Journal of East Asian Studies, 16(1): 43–60.

Nordhaus, William D., 1975. The political business cycle, The Review of Economic Studies, 42(2): 169–190.

Prendergast, Canice, and Topel, Robert H., 1996. Favoritism in organizations. Journal of Political Economy, 104(5): 958–978.

Qian, Yingyi, and Roland, Gerard, 1998. Federalism and the soft budget constraint. American Economic Review, 88(5): 1143–1162.

Sapienza, Paola, 2004. The effects of government ownership on bank lending. Journal of Financial Economics, 72(2): 357–384.

Shleifer, Andrei, and Vishny, Robert W., 1993. Corruption. The Quarterly Journal of Economics, 108(3): 599–617.

Shleifer, Andrei, and Vishny, Robert W., 1994. Politicians and firms. The Quarterly Journal of Economics, 109(4): 995–1025.

Shih, Victor, Adolph, Christopher, and Liu, Mingxing, 2012. Getting ahead in the Communist Party: Explaining the advancement of Central Committee members in China. American Political Science Review, 106(1): 166–187.

Song, Zheng Michael, and Xiong, Wei, 2018. Risks in China's financial system. Annual Review of Financial Economics, 10(1): 261–286.

Sun, Qian, and Tong, Wilson H.S., 2003. China share issue privatization: The extent of its success. Journal of Financial Economics, 70(2): 183–222.

Voth, Joachim, and Xu, Guo, 2020. Patronage for productivity: Selection and performance in the age of sail. Working Paper.

Washington, Ebonya L., 2008. Female socialization: How daughters affect their legislator fathers. American Economic Review, 98(1): 311–32.

Xu, Chenggang, 2011. The fundamental institutions of China's reforms and development. Journal of Economic Literature, 49(4):1076–1151.

Xu, Guo, 2018. The costs of patronage: Evidence on the British Empire. American Economic Review, 108(11): 3170–3198.

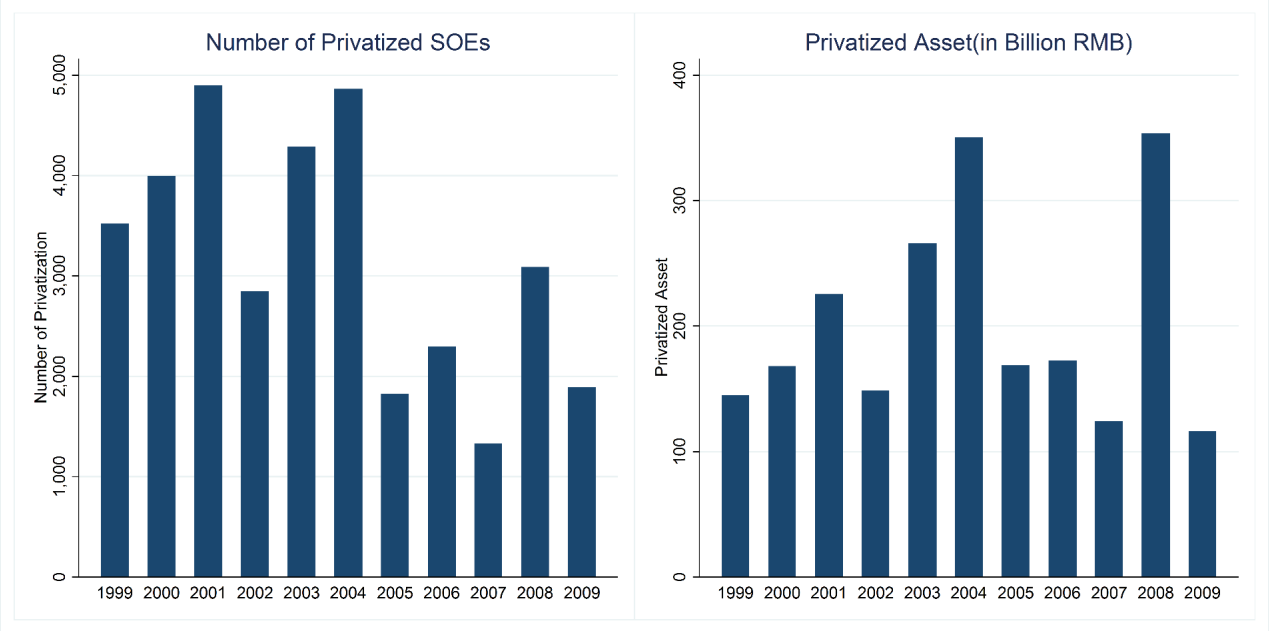
Xu, Guo, 2019. The colonial origins of fiscal capacity: Evidence from patronage governors. Journal of Comparative Economics, 47(2): 263–276.

Yao, Yang, 2005. Chinese privatization: Causes and outcomes. China and World Economy 13: 66–80.

Zhu, Jiangnan, and Zhang, Dong, 2017. Weapons of the powerful: Authoritarian elite competition and politicized anti-corruption in China. Comparative Political Studies, 50(9): 1186–1220.

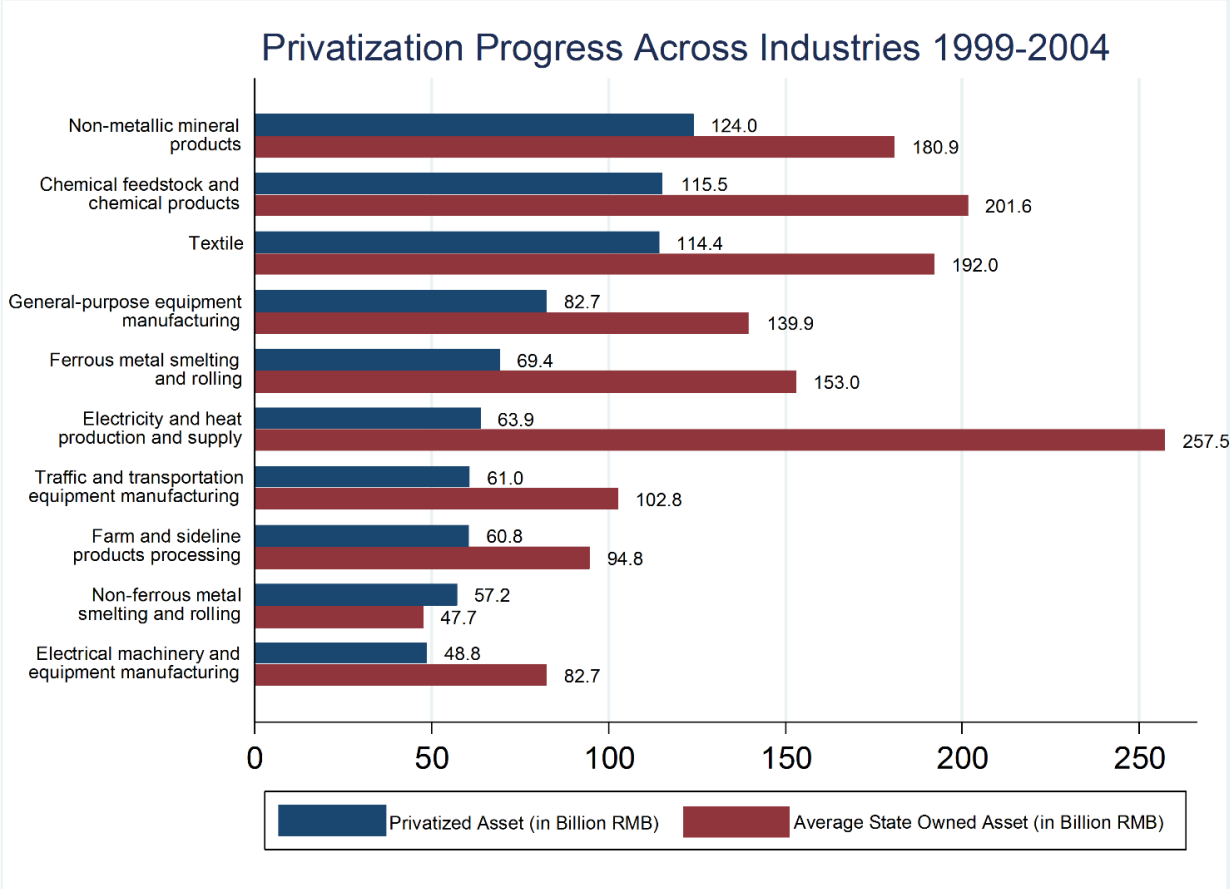
Appendix figures and tables

Figure A.1 Number of privatization and privatized assets of local SOEs at the city-level or below over time



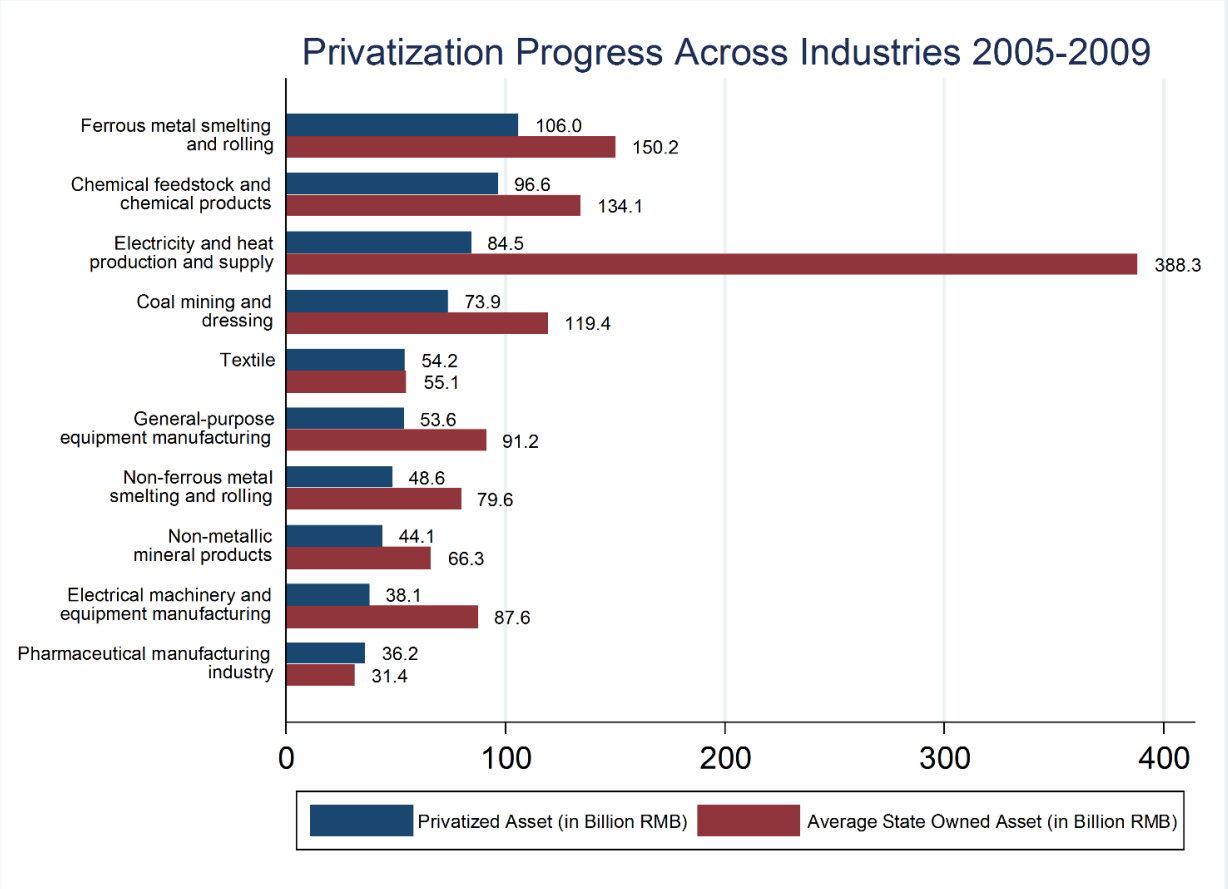
This figure illustrates the privatization pattern from 1999 to 2009. The left graph shows the number of privatized firms per year, and the right graph shows the amount of privatized asset per year.

Figure A.2 Panel A Privatization progress across industries 1999—2004



This figure shows the local SOEs' privatization progress across industries. Privatized Asset denotes the assets that are privatized within each industry for each period. For each firm, privatized asset equals the privatization dummy times the firm's total asset. Average State-Owned Asset denotes the averaged assets owned by the government within each industry in each period. Asset owned by the government in each firm equals total asset times the percentage share owned by the government. Top 10 industries (sorted by privatized asset) are displayed. Panel A and Panel B illustrate the privatization progress across industries in 1999–2004 and 2005–2009, respectively.

Figure A.2 Panel B Privatization progress across industries 2005—2009



This figure shows the local SOEs' privatization progress across industries. Privatized Asset denotes the assets that are privatized within each industry for each period. For each firm, privatized asset equals the privatization dummy times the firm's total asset. Average State-Owned Asset denotes the averaged assets owned by the government within each industry in each period. Asset owned by the government in each firm equals total asset times the percentage share owned by the government. Top 10 industries (sorted by privatized asset) are displayed. Panel A and Panel B illustrate the privatization progress across industries in 1999–2004 and 2005–2009, respectively.

Table A.1 Variable definitions and constructions

Variable	Description
Private	Dummy variable that equals one if the firm is concurrently registered as a private enterprise, and zero otherwise.
Private Share	Percentage share that is owned by the private parties, such as individuals, foreign investors, and non-government institutes.
TFP	The residual value obtained from the regression of the natural log of total revenues on the natural log of total assets and the natural log of total employment following Cobb-Douglas form in the panel of all firms in the CIC survey from 1998 to 2009. It is winsorized at 1% at both ends.
ROA	Net income divided by the current year total asset times 100. It is winsorized at 1% at both ends.
OROA	Operating profit divided by the current year total asset times 100. It is winsorized at 1% at both ends.
Log(Sale)	The natural logarithm of the operating income of the firm.
MktShare	The percent of the firm's operating revenues in the entire 2-digit industry across China.
Log(Asset)	The natural logarithm of the total asset of the firm.
⊿TFP_2	Average TFP two years after the privatization minus average TFP two years before the privatization.
⊿ROA_2	Average ROA two years after the privatization minus average ROA two years before the privatization.
⊿OROA_2	Average OROA two years after the privatization minus average OROA two years before the privatization.
Connection	Dummy variable that equals one if the city politician is concurrently connected to at least one full Central Committee member of CPC, and zero otherwise.
Connection#	Number of Central Committee members that the city politician is concurrently connected to.
Age	City politician's contemporaneous age.
Gender	Dummy variable that equals one if the city politician is male, and zero otherwise.
Minority	Dummy variable that equals one if the city politician's ethnicity is non-Han, and zero otherwise.
Tenure	The number of years the city politician has been in this position.
Education	Dummy variable that equals one if the city politician is concurrent educational attainment is higher than or equal to a master's degree, and zero otherwise.
FiscalExpense	Fiscal expense of the city government. In 100 million RMB.
FiscalRevenue	Fiscal revenue of the city government. In 100 million RMB.
ValueLossAmount	The natural logarithm of the value loss amounts in the privatization deal. The value loss amount is equal to the market value of the shares transferred in privatization minus the actual selling price (i.e., (market trading price - actual selling price)×total shares transferred).
PrivateBuyer	Dummy variable that equals one if the buyer of the share transfer deal is registered as a privately owned enterprise.
FractionTransfered	The ratio between the number of shares transferred in this deal to all outstanding shares.
TurnOver	Average daily turnover of the stock in the last year.
Leverage	The ratio between total borrowings to total assets of the firm.
Corruption	The natural logarithm of the corruption amount of the investigated city politician. Corruption amount is the sum of bribes received and political graft.
Ln(Sentence/Corruption)	Natural logarithm of the ratio between the number of years sentenced and corruption amount.
Investigation	Dummy variable that equals one if the city politician is investigated in this year.
TFP (With Fixed Effects)	The residual value obtained from the regression of the natural log of total revenues on the natural log of total assets and the natural log of total employment following Cobb-Douglas form in the panel of all firms in the CIC survey from 1998 to 2009. 2-digit industry dummies and year dummies are included in the regression. It is winsorized at 1% at both ends
TFP (Value Added)	The residual value obtained from the regression of the natural log of industrial value-added amount on the natural log of total assets and the natural log of total employment following Cobb-Douglas form in the panel of all firms in the CIC survey from 1998 to 2009. 2-digit industry dummies and year dummies are included in the regression. It is winsorized at 1% at both ends.
SOERatio	The ratio of the number of firms privatized over the total number of SOEs in this city.
AssetRatio	The ratio of total privatized assets over total assets of all SOEs in this city.

Table A.2 Robustness check (alternative TFP measures)

Panel A: Privatization consequence				
Variables	(1) *TFP (with fixed effects)*	(2) *TFP (value added)*	(3) *TFP (with fixed effects)*	(4) *TFP (value added)*
Private	0.057***	0.062***		
	(0.005)	(0.007)		
Private Share			0.080***	0.079***
			(0.004)	(0.006)
Controls	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	495,876	304,281	462,052	297,398
Adj. R-squared	0.099	0.051	0.099	0.048
Panel B: Political connection and privatization consequence				
Variables	(1) *TFP (with fixed effects)*	(2) *TFP (value added)*	(3) *TFP (with fixed effects)*	(4) *TFP (value added)*
Private	0.081***	0.095***	0.081***	0.093***
	(0.007)	(0.011)	(0.007)	(0.010)
Connection × *Private*	–0.040***	–0.055***		
	(0.009)	(0.013)		
Connection# × *Private*			–0.034***	–0.045***
			(0.007)	(0.009)
Controls	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	495,876	304,281	495,876	304,281
Adj. R-squared	0.099	0.051	0.099	0.051

This table presents the results of OLS panel regressions on privatization consequences. The panel is from 1998 to 2009 and is restricted to local SOEs at the city level or below. *TFP (With Fixed Effects)* is the residual in the regression of *Log(Sales)* against *Log(Asset)* and *Log(Employment)* in the panel of firms with industry fixed effects and year fixed effects. *TFP (Value Added)* is calculated with the same regression as *TFP (with Fixed Effects)* replacing *Log(Sales)* by *Log(Value-Added)*. *Private* is a dummy that takes the value of one if the firm is concurrently registered as a private firm. *Private Share* is the share of ownership that is owned by the private sector. *Connection* is a dummy variable that takes the value of one if the city secretary is concurrently connected with at least one full Central Committee members in the year of privatization. *Connection#* counts the number of contemporaneous connections that the city secretary has with Central Committee members in the year of privatization. *Log(Asset)* is controlled in all columns. Firm and year fixed effects are controlled in each column. See Table A.1 for detailed variable definitions. Standard errors are clustered at the firm level and reported in parenthesis. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table A.3 Political connection and privatization consequence (cross-sectional)

Panel A: Connection dummy						
Variables	(1) ΔTFP_1	(2) ΔROA_1	(3) ΔOROA_1	(4) ΔTFP_2	(5) ΔROA_2	(6) ΔOROA_2
Connection	–0.026***	–0.416***	–0.640***	–0.033***	–0.732***	–0.919***
	(0.008)	(0.142)	(0.174)	(0.009)	(0.171)	(0.206)
Controls	YES	YES	YES	YES	YES	YES
Privatization year FE	YES	YES	YES	YES	YES	YES
Observations	27,240	27,614	27,639	14,955	15,233	15,239
Adj. R-squared	0.009	0.003	0.005	0.012	0.014	0.016
Panel B: Number of connections						
Variables	(1) ΔTFP_1	(2) ΔROA_1	(3) ΔOROA_1	(4) ΔTFP_2	(5) ΔROA_2	(6) ΔOROA_2
Connection#	–0.020***	–0.341***	–0.515***	–0.021***	–0.482***	–0.667***
	(0.006)	(0.109)	(0.133)	(0.007)	(0.127)	(0.153)
Controls	YES	YES	YES	YES	YES	YES
Privatization year FE	YES	YES	YES	YES	YES	YES
Observations	27,240	27,614	27,639	14,955	15,233	15,239
Adj. R-squared	0.009	0.003	0.005	0.012	0.013	0.016

This table presents the results of cross-sectional regressions of privatization outcomes implemented by connected politicians versus unconnected politicians. The panel is from 1998 to 2009 and restricts to local SOEs at the city level or below with non-missing observation in the sample period. *Connection* is a dummy variable that takes the value of one if the city secretary is concurrently connected with at least one full Central Committee members in the year of privatization. *Connection#* counts the number of contemporaneous connections that the city secretary has with Central Committee members in the year of privatization. *ΔTFP_1*, *ΔROA_1*, and *ΔOROA_1* are the changes in *TFP*, *ROA*, and *OROA* one year before and after the privatization, respectively. *ΔTFP_2*, *ΔROA_2*, and *ΔOROA_2* are the average annual changes in *TFP*, *ROA*, and *OROA* two years before and after the privatization, respectively. *Log(Average Asset)* are controlled in columns of *ΔTFP_1* and *ΔTFP_2*. *Log(Average Sales)* is controlled in the rest columns. The fixed effects of privatization year are controlled in each column. See Table A.1 for detailed variable definitions. Standard errors are clustered at the firm level and reported in parenthesis. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table A.4 Regression discontinuity design (different bandwidths)

Variables	(1) ΔTFP_2	(2) ΔROA_2	(3) $\Delta OROA\_2$
Local Wald estimator 100%	0.310**	3.287**	6.116
	(0.144)	(1.456)	(3.818)
Local Wald estimator 200%	0.257***	3.402**	5.016**
	(0.088)	(1.345)	(2.002)
Local Wald estimator 300%	0.181***	3.061**	4.671**
	(0.058)	(1.231)	(1.839)
Observations	14,469	14,657	14,665

This table reports firm-level results from the fuzzy regression discontinuity. The sample is restricted to firms that are privatized by city secretaries who are ever connected with central committee members (except Politburo members). For a robustness check, on both sides around the cut-off, 100%, 200%, and 300% optimal bandwidths given by Imbens and Kalyanaraman (2012) are used. Triangular kernel is used in the local linear regression. The assignment variable is distance between the connected Central Committee's start term age and the age cut-off. The treatment variable is a dummy that takes the value of 1 if the connected Central Committee member has completed his final term. The outcome variable is the firm-level privatization consequence, as in Table V. *ΔTFP_2*, *ΔROA_2*, and *ΔOROA_2* are the average annual changes in *TFP*, *ROA*, and *OROA* two years before and after the privatization, respectively. Standard errors clustered at the politician level are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table A.5 Political connection and privatization activity

Panel A: Connection dummy				
Variables	(1) *SOERatio*	(2) *SOERatio*	(3) *AssetRatio*	(4) *AssetRatio*
Connection	–0.103 (0.361)	–0.090 (0.365)	–1.045 (0.644)	–1.023 (0.642)
Ln(FiscalExpense)		0.696 (0.661)		0.821 (1.355)
Ln(FiscalRevenue)		–0.060 (0.656)		–1.240 (1.325)
City Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	3,693	3,673	3,403	3,401
Adj. R-squared	0.173	0.171	0.048	0.048
Panel B: Number of connections				
Variables	(1) *SOERatio*	(2) *SOERatio*	(3) *AssetRatio*	(4) *AssetRatio*
Connection#	–0.044 (0.285)	–0.043 (0.287)	–0.735 (0.503)	–0.718 (0.501)
Ln(FiscalExpense)		0.696 (0.663)		0.831 (1.356)
Ln(FiscalRevenue)		–0.063 (0.656)		–1.242 (1.323)
City Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	3,693	3,673	3,403	3,401
Adj. R-squared	0.173	0.171	0.048	0.048

This table presents the OLS regressions of privatization decisions. The CIC firm-year panel is aggregated into a city year panel. In Panel A, the main independent variable *Connection* is a dummy variable that takes the value of 1 if the concurrent city secretary is connected with at least one central committee member. In Panel B, the main independent variable, *Connection#*, counts the number of connections that the concurrent city secretary possesses with central committee members. In columns (1) and (2) in both panels, the dependent variable *SOERatio* is the ratio of the number of firms privatized over the total number of SOEs in this city. In columns (3) and (4) in both panels, the dependent variable *AssetRatio* is the ratio of total privatized assets over total assets of all SOEs in this city. City and year fixed effects are controlled in each column. *Ln(FiscalExpense)* and *Ln(FiscalRevenue)* are further controlled in the even columns. Standard errors are clustered at the city level and reported in parenthesis. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

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