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Nexus Effect: Unraveling the Impact of Political Patronage Connections on Corporate Investment

Ping Guo
Dongbei University of Finance and Economics School of Accountancy
guoping@dufe.edu.cn

Guifeng Shi
Shanghai Jiao Tong University Antai College of Economics & Management
shigfeng@sjtu.edu.cn

Gary Gang Tian
Macquarie University Department of Applied Finance
gary.tian@mq.edu.au (corresponding author)

Abstract

This study investigates how political patronage influences local firms' investment decisions in China, focusing on changes in patronage ties resulting from provincial leadership turnover. By examining prefectural officials with connections to their provincial superiors, we find that firms in these regions experience increased investment expenditures, albeit with reduced efficiency. This effect is primarily driven by stronger promotion incentives for local officials, bolstered by favoritism from provincial patrons. While political patronage helps address agency problems within political hierarchies, our findings highlight its adverse economic impact due to misaligned interests between politicians and the public.

I. Introduction

The existing literature highlights the substantial influence of politicians' networks on power distribution and resource allocation (Brown and Huang (2020), Moon and Schoenherr (2022), Piotroski, Wong, and Zhang (2022), and Xu (2018)). However, the way in which patronage connections with high-level political leaders affect local officials' promotion incentives and work efforts remains a topic of debate (e.g., Jiang (2018), Xu (2018)). Given that officials' political incentives hold important implications for firms operating within their jurisdictions (e.g., Alok and Ayyagari (2020), Duchin and Sosyura (2012)),

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the extent to which politicians' patronage connections permeate firm operations warrants further academic investigation.

Our study explores the economic consequences at the firm level resulting from the patronage networks of local officials with their superiors. Specifically, we examine the investment decisions of Chinese firms situated in prefectures in which the top 2 local officials, the mayor or the party secretary (hereafter referred to as prefectural officials), have connections with higher-ranking provincial leaders, namely the governor or the party secretary,[1] through shared educational networks.[2] Corporate investments play a critical role in value creation for firms and are influenced by various political factors (Duchin and Sosyura (2012), Gulen and Ion (2016)). Given that corporate investment significantly contributes to government fiscal revenue, employment generation, and local economic growth (Han and Kung (2015), Keynes (2018)), it substantially influences government performance. Consequently, supporting the development of local firms becomes a priority for local officials.[3] We contend that variations in firms' investment levels offer indirect evidence of the impact of political incentives arising from patronage on firm operations.

Our study focuses on a sample of Chinese prefectural officials who maintain connections with their superior provincial leaders through school ties. This focus is motivated by several reasons. First, China's single-party political system relies heavily on political appointment and promotions to incentivize and mobilize local officials to fulfill their duties (Li and Zhou (2005)). Second, within China's hierarchical political structure, each prefectural government is directly affiliated with a superior provincial government. The connections between prefectural officials and provincial leaders offer a cross-sectional treatment of politicians' patronage networks for firms located in different prefectures. Moreover, the turnover of officials at both levels introduces time series variations in patronage connections, allowing for robust empirical analysis. Third, prefectural governments in China possess incentives and capabilities to influence business activities and shape corporate decisions through allocating resources and implementing policies (Jiang (2018)). These institutional characteristics make China an ideal setting for examining the corporate outcomes of politicians' patronage networks.

To measure the patronage networks between prefectural and provincial officials, we use their shared school (university) ties. The sociological and economic literature suggests that school connections have a stronger influence on the formation of intimate relationships than workplace connections (Cohen, Frazzini, and Malloy (2010), McPherson, Smith-Lovin, and Cook (2001)). A common educational background provides a solid foundation for forming and maintaining close

[1]China's administrative divisions comprise five levels: provincial, prefectural, county, township, and village. The prefectural level encompasses prefectures, prefecture-level cities, autonomous prefectures, and leagues. For simplicity, we will use the term "prefectures" to refer to all regions at the prefecture level.

[2]Drawing on the existing literature on social connections, we have also considered other potential proxies for politicians' patronage connections in our research, such as hometown ties, work ties, and political appointments.

[3]For examples, see http://jxj.ningbo.gov.cn/art/2022/6/8/art_1229561617_58934561.html and http://www.qingdao.gov.cn/ywdt/zwyw/202204/t20220403_5195404.shtml.

social relationships (Massa and Simonov (2011)). In contrast, informal workplace relationships can vary greatly in strength and attributes (McPherson et al. (2001), Venkataramani, Labianca, and Grosser (2013)).[4] While some studies use work ties as proxies for politicians' patronage networks, showing that connections with high-ranking politicians influence political selection in China (Jia, Kudamatsu, and Seim (2015)), work ties may not always be a suitable proxy for social connections in certain research contexts (Guan, Su, Wu, and Yang (2016)). Other studies employ political appointments (because prefectural officials are appointed by incumbent provincial leaders) as proxies for politicians' patronage networks in China (Jiang (2018), Lei (2023)). However, political appointment decisions are typically influenced by various factors beyond connections, such as merit (Li and Zhou (2005)) and power competition within the party (Francois, Trebbi, and Xiao (2023)). Consequently, an appointment-based approach may introduce upward biases in measuring patronage connections[5] and lead to significant selection-bias issues.[6] In contrast, identity-based informal connections, such as those formed through shared educational experiences, are predetermined and therefore exogenous to the current political process (Cohen and Malloy (2014)). Given that the turnover of provincial and prefectural officials, specifically, the former, is difficult to manipulate, the formation or loss of a connection based on school ties between provincial and prefectural officials is largely exogenous.[7] This strengthens our empirical framework, which uses identity-based patronage ties, making it better suited for identifying the causal impact of politicians' patronage networks on corporate investment behavior.[8]

Drawing on social identity theory, shared school experiences facilitate the development of common values and social norms (Akerlof and Kranton (2000)) and foster altruistic behaviors toward in-group members (Chen and Li (2009)). School ties between prefectural and provincial officials promote mutual trust and cooperation, granting connected prefectural officials greater responsibilities and more opportunities for advancement (Jia et al. (2015), Jiang (2018)). The prospect

[4]Individuals who share working experience are just as likely to become competitors as friends (Jiang (2018)). For instance, Francois et al. (2023) find that shared professional backgrounds among political elites may actually intensify competition between them.

[5]For instance, studies by Jiang (2018) and Lei (2023) show that a substantial proportion (approximately 60%–80%) of the samples consists of connected politicians, a figure that exceeds expectations.

[6]For instance, if prefectural leaders are appointed according to merit, it becomes difficult to isolate the effect of politicians' networks because the prefectures they govern are likely to demonstrate improved economic performance and increased corporate investments as a result of their competent leadership.

[7]While hometown networks could also fall into the category of predetermined, identity-based networks, the prevalence of such ties between provincial and prefectural leaders in our sample is limited. Consequently, the variable representing hometown ties is often automatically omitted in the subsample regressions. As a result, we do not explicitly emphasize the significance of hometown ties, but we include it as a control variable in robustness tests to ensure the effects of school ties remain robust when compared with other forms of social connections.

[8]To further validate the observed effects of school ties, we controlled work ties in our regression analyses. In our clean sample analyses, the patronage connections are established solely because of the turnover of provincial patrons, meaning no connected prefectural officials are appointed by their provincial patrons. Therefore, we do not need to control appointment ties in our regression analyses.

of enhanced career advancement motivates prefectural officials to invest more effort in local governance. Because corporate investments drive economic growth, prefectural officials actively encourage local firms to invest to enhance local government performance. Furthermore, connected prefectural officials can use support from their provincial patrons in areas such as fiscal transfers and bureaucratic approvals (Jiang and Zhang (2020), Lei (2023)), which strengthens the capacity of prefectural governments to promote local firms' investments.

While firms in prefectures with connected local officials (referred to as connected prefectures) may exhibit higher levels of investment expenditure, the impact of politicians' patronage networks on corporate investment efficiency is less clear. Patronage helps resolve the agency problem between prefectural and provincial officials, aligning their interests and goals. This alignment can facilitate information sharing and cooperation, potentially improving corporate investment efficiency. However, the interests of prefectural and provincial officials are not always aligned with those of the public. Patronage networks may lead to biased resource allocation across the broader economy (McPherson et al. (2001)). Prefectural officials' loyalty to their patrons, driven by career advancement incentives, may distort their behaviors, resulting in increased economic growth at the expense of efficiency. Therefore, the effect of politicians' patronage networks on investment efficiency warrants further investigation.

Our full sample includes publicly listed firms located in 243 prefectural units across 25 provincial administrative regions of China, covering the period from 2003 to 2018.[9] Consistent with our hypothesis that patronage connections between prefectural and provincial officials stimulate increased investment by local firms, this effect remains robust even after addressing various endogeneity concerns. To further validate our findings, we focus on changes in patronage connections established through the turnover of provincial leaders, restricting the sample to officials who served as prefectural officials before their provincial superiors took office. Using a difference-in-difference (DiD) research design, we find that firms in connected prefectures experience a 29.85% increase in investment expenditures.

In addition, cross-sectional analyses show that the patronage effect on corporate investment is stronger when the network is more robust, as indicated by shorter distances to the alma mater and more active alumni networks. The positive effect of patronage on corporate investment is also more pronounced in provinces that have strong collectivist cultures and weak social trust, where the demand for political networking is higher.

To investigate whether and how promotion incentives of connected prefectural officials increase the investment of local firms, we first employ political promotion as a proxy for rewarding hard work and the age of prefectural officials as an additional dimension of their promotion prospects. Our findings suggest that the positive impact of politicians' networks on corporate investments is more pronounced when prefectural officials are promoted by their connected provincial

[9]Data from the National Bureau of Statistics website (https://data.stats.gov.cn/easyquery.htm?cn=C01) indicate that there were 333 prefectural administrative units affiliated with 27 provincial governments in China in 2018. However, for the purpose of our analysis, we are able to obtain data for only 243 prefectures located in 25 provinces.

leaders and when they have greater opportunities for career advancement because of their age. In addition, we observe that increased corporate investment is concentrated in connected prefectures and among firms heavily influenced by prefectural officials, indicating a direct link between corporate investment and the governance efforts of connected officials. We further show that connected prefectural governments promote investment by local firms mainly through granting government subsidies, endorsing corporate bonds, and developing provincial special economic zones.

Regarding the quality effect of politicians' patronage networks, our findings reveal less efficient investment decisions by local firms. Specifically, connections between prefectural officials and provincial leaders tend to induce overinvestment, impede corporate innovation, and decrease total factor productivity. We also find that investors in firms located in connected prefectures have recognized this efficiency loss, as evidenced by the negative market reaction when those provincial patrons assumed office. Inefficient corporate investment is further reflected in low productivity at the aggregate economic level of connected prefectures. Connected prefectural officials do not strive to maximize local economic growth but instead aim to meet the economic growth targets set by provincial governments. This evidence suggests that politicians' patronage networks benefit both client and patron officials at the expense of broader economic efficiency.

Our research contributes to the literature in several ways. First, our findings add to the growing body of work investigating the corporate outcome of political networks. Prior studies show that firms benefit from political connections based on shareholders' or managers' relationships with politicians (Faccio (2006), Fisman (2001)). More recent studies find that corporate managers' meetings with politicians are positively associated with firm value (Brown and Huang (2020)). Firms in regions in which politicians were born or had work experience tend to invest more in those politicians' jurisdictions (Guo, Shi, Tian, and Duan (2021), Shi, Xi, Zhang, and Zhang (2021)). Two recent studies are particularly relevant to ours. Moon and Schoenherr (2022), focusing on political patronage and cronyism in South Korea, find that firms connected to the president's network receive favorable credit allocation, albeit at the cost of economic efficiency. Piotroski et al. (2022) show significant stock price comovements among firms connected to the same political network of China's senior officials. Unlike these studies, which focus on direct politician–firm connections, we emphasize the interconnections among politicians. Unlike politician–firm connections, patronage networks among politicians are less prone to endogeneity concerns because these interconnections are less likely to result from firm decisions (Piotroski et al. (2022)). Our findings demonstrate a significant spillover effect of politicians' patronage networks on corporate outcome, extending the research on the consequence of political patronage to the micro-economy level.

Second, our study contributes to the literature on patronage by demonstrating that interconnections among politicians incentivize subordinate officials, but at the expense of economic efficiency. Prior research shows that patronage can either incentivize subordinates when distributive favoritism is absent (Jiang (2018)) or disincentivize them because of favoritism (Xu (2018)). Our study suggests that promotion incentives and favoritism can co-exist within patronage dynamics. Our

corporate-level evidence shows that politicians' patronage networks benefit both client and patron officials, and they do so at the cost of economic efficiency. This provides a more comprehensive framework for understanding the role of patronage in enhancing incentives and its broader economic implications.

Third, our study extends the literature on political influence on corporate investment. Prior studies show that firm investment decisions can be influenced by government policies and political uncertainty (Gulen and Ion (2016)). In addition, political incentives driven by corruption or elections are found to distort firm investment behaviors (Alok and Ayyagari (2020), Shi et al. (2021)). In line with these findings, our study uncovers how politicians' patronage networks shape the promotion incentives of subordinate officials, thus influencing corporate investment within politicians' jurisdictions. We contribute to the literature by providing new evidence of a positive effect on firm investment driven by politicians' connections with higher-ranked political leaders, though this comes at the cost of investment efficiency.

II. Politicians' Patronage Networks and Corporate Investments

A. Cooperation Problem Across Government Hierarchies and Politicians' Patronage Networks

Mobilizing subordinates to pursue organizational goals rather than serve their self-interests presents a challenge for organizational leaders (Alchian and Demsetz (1972)). In government, interagency cooperation is even more difficult because of the absence of an effective reward system and limited monitoring mechanisms (La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1996)). Therefore, trust becomes crucial within the government hierarchy. In China's political system, in which control of the local economy is decentralized among geographically dispersed levels of governments, addressing these agency issues is particularly important (Li and Zhou (2005)). The selection and appointment process for bureaucrats in China lacks explicit, objective promotion criteria,[10] resulting in a somewhat opaque political landscape (Francois et al. (2023)). Higher-level politicians have significant discretion over the promotion prospects of their subordinates, leading to high levels of uncertainty about rewards for hard work. Building cooperation between politicians at various hierarchical levels is challenging because their unequal statuses hinder the formation of horizontal ties and impede mutual trust (Putnam, Leonardi, and Nanetti (1994)).

Relational contracts offer a potential solution to the cooperation challenge within government hierarchies. When leaders and subordinates have trusting relationships, leaders are inclined to provide subordinates with greater resources and rewards in exchange for increased work effort, both within and beyond their

[10]The Central Organization Department's civil servant performance assessment criteria (see https://www.12371.cn/2021/01/11/ARTI1610349207260939.shtml) stipulate that civil servants must be comprehensively evaluated in terms of their morality, competence, diligence, accomplishments, and probity, all of which are highly subjective factors.

assigned roles (Henderson, Wayne, Shore, Bommer, and Tetrick (2008)). Therefore, politicians' patronage networks can significantly improve the work attitudes and performance of lower-level officials (Jiang (2018), Jiang and Zhang (2020), and Martin, Thomas, Legood, and Dello Russo (2018)). In this study, we focus on politicians' patronage networks formed through school ties. A shared educational background fosters social identity and belonging, leading to shared cultural values and behavioral norms (Akerlof and Kranton (2000)). These similar social norms reinforce mutual trust, facilitate interest alignment and conflict resolution, and encourage cooperation (Chen and Li (2009)). Importantly, educational networks continue to strengthen through alumni events and organizations even after graduation, providing a solid foundation for mutual trust and cooperation between politicians across hierarchy levels. Within these networks, leaders reward subordinate officials by recognizing their abilities and providing political support in exchange for their knowledge, skills, efforts, and loyalty.

B. The Quantity Effect of Politicians' Patronage Networks on Corporate Investments

Patronage connections with superiors can create a sense of obligation among subordinate officials (Henderson et al. (2008)), thus incentivizing them to exert greater effort in local economic management. Connected local governments are more likely to improve infrastructure and the rule of law, creating a more favorable business environment for corporate investment activities (Jiang (2018), Keynes (2018)). In response to better promotion prospects, subordinate officials actively seek to enhance local economic performance by promoting investment by local firms. Local officials in China possess the means to facilitate corporate investments through their control of economic resources (Duchin and Sosyura (2012)), such as promoting lending by financial institutions (La Porta, Lopez-De-Silanes, and Shleifer (2002)), increasing government spending, and implementing preferential tax policies (Zwick and Mahon (2017)). Moreover, connected jurisdictions may receive preferential treatment in terms of political resource allocation, including project approvals, fiscal transfers, and policy support (Jiang and Zhang (2020), Lei (2023)). As a result, firms in these connected jurisdictions enjoy easier access to funding and licenses for investment projects. In line with these discussions, we propose the following hypothesis:

Hypothesis 1. When a local government is connected to a higher-level authority through politicians' patronage networks, local firms exhibit higher levels of investment expenditures.

C. The Quality Effect of Politicians' Patronage Networks on Corporate Investments

While it may seem plausible that firms in connected prefectures exhibit higher levels of investment expenditures, politicians' patronage networks can have a dual effect on the investment efficiency of local firms. Patronage connections mitigate agency problems and foster cooperation between local officials and their superiors,

potentially leading to better investment decisions. First, stronger promotion incentives and resource-allocation advantages enable connected local governments to better support local firms, providing easier access to resources and reducing the chance of forgoing projects that have a positive net present value. Second, the close relationships between local officials and their superiors enhance communication and improve understanding of higher-level government policies. This information advantage allows connected governments to make more efficient economic decisions, leading firms to invest in higher-quality projects.

However, politicians' interests are not always aligned with those of the public. While patronage networks help mitigate the agency problem within political hierarchies, benefiting both patrons and client politicians, they may also lead to efficiency losses for the broader economy. First, stronger promotion incentives can distort local officials' economic management decisions. To demonstrate loyalty to their superiors and improve their promotion prospects, local officials may implement aggressive economic policies, potentially resulting in overproduction by local firms. Second, officials benefiting from patronage connections may experience favoritism, leading to unbalanced resource distribution across the economy. The flow of information and resources within localized patronage networks may cause excessive investment by firms within connected jurisdictions. Furthermore, unequal growth opportunities may diminish the work incentives of individuals without such connections, exacerbating regional imbalances and hindering efficient resource allocation.

Therefore, while mitigating the agency problem benefits politicians, it may harm the overall economy because of misaligned interests between politicians and the public. As a result, we propose two competing hypotheses on the overall impact of politicians' patronage networks on corporate investment efficiency:

Hypothesis 2a. When a local government is connected to a higher-level authority through politicians' patronage networks, local firms exhibit higher levels of investment efficiency.

Hypothesis 2b. When a local government is connected to a higher-level authority through politicians' patronage networks, local firms exhibit lower levels of investment efficiency.

III. Sample, Research Design, and Summary Statistics

A. Sample and Data

1. Politicians' Patronage Networks

We examine the patronage networks of officials at the prefectural and provincial levels in China. Specifically, we identify the connection between a prefectural government and its superior provincial government through politicians' patronage networks when any incumbent prefectural official (i.e., mayor or party secretary) shares an educational network with any of their incumbent superior provincial

leaders (i.e., governor or party secretary). Our data set consists of 201 provincial leaders and 2391 prefectural officials who held these positions between 2003 and 2018. We manually collect comprehensive background information on these politicians, including their birthplace, birth year, and detailed education and work history, from reliable sources such as China Leaders and Baidu Baike. Following the existing literature on school ties, we consider politicians as socially connected through school ties if they attended the same university for either their undergraduate or graduate degree, irrespective of their enrollment period, campus location, or major. Provincial leaders who serve in their home provinces tend to have more intricate social networks within their jurisdictions (Raymond, Brown, and Weber (2010)). These leaders have extensive experience living and working in the provinces in which they were born and raised, leading to personal connections with numerous subordinate officials in their home provinces through various forms of social bonding. However, because of the complexity and unobservability of these connections, it is challenging to identify them. Therefore, similar to prior studies (Xu and Li (2019)), we focus solely on provincial leaders (i.e., governors or party secretaries) serving outside their provinces of origin.

2. Firm Data

We obtain firms' financial data and basic business information, including data on cash flows, assets, debt, ownership, and registration locations, from the China Stock Market and Accounting Research database.[11] Our sample includes all A-share firms traded on the Shanghai and Shenzhen stock exchanges but excludes i) firms missing essential information required for our regressions, ii) firms in the financial industry, and iii) cross-listed firms that have B-shares or H-shares.

B. Model Specification and Variable Definitions

Using political turnover, which induces exogenous changes in connection status at various times for prefectural governments, we design the following staggered DiD regression model to examine the relationship between politicians' patronage networks and corporate investments:

$$
\begin{aligned}
(1) \qquad Invest_{i,t+1} = {} & \beta_0 + \beta_1 Schoolties_{i,t} \times Incumbent_{i,t} + \beta_2 Workties_{i,t} \\
& \times Incumbent_{i,t} + \beta_3 University985_{i,t} + \beta_4 University211_{i,t} \\
& + \beta_5 Earlytenure_{i,t} + \beta_6 TQ_{i,t} + \beta_7 CFO_{i,t} + \beta_8 Lev_{i,t} \\
& + \beta_9 Equityfin_{i,t} + \beta_{10} Size_{i,t} + \beta_{11} SOE_{i,t} + \beta_{12} PC_{i,t} \\
& + \beta_{13} GDP_{i,t} + FirmFE + YearFE + \varepsilon_{i,t}
\end{aligned}
$$

where i and t denote the firm and year, respectively. The dependent variable is corporate investment (*Invest*), which measures the cash payments made for fixed, intangible, and other long-term assets, adjusted for cash receipts from asset sales and depreciation and amortization. This variable is scaled by total assets to account

[11] Chinese company law typically mandates that firms establish their headquarters at the place of their registration. As a result, the registration locations of Chinese firms are generally synonymous with their headquarters' locations.

for firm size.[12] Given that investment decisions often require time to adapt to changes in prefecture connection status, our analysis centers on investments made in the year following year *t*. This approach is consistent with established practices in the investment literature (e.g., Chen, Sun, Tang, and Wu (2011), Gulen and Ion (2016)). We introduce the variable *Schoolties* to indicate whether a firm is in a treatment prefecture in which the government has been, is, or will be connected to its corresponding provincial government through school ties between prefectural and provincial officials. The variable *Incumbent* is used to identify whether the connected officials are currently holding office in a year.[13] We construct the interaction term *Schoolties*× *Incumbent*, which acts as an indicator of the connection status of a prefectural government. This interaction term takes the value of 1 when a connected prefecture maintains its connection and 0 when a connection is lost because of the departure of one member of the connected pair from office. In equation (1), we apply firm and year fixed effects to conduct a staggered DiD estimation, allowing *Schoolties*× *Incumbent* to capture the impact of connections between prefectural and provincial governments on local corporate investment. The main effects of *Schoolties* and *Incumbent* are not included with the control of the 2-way fixed effects.

The staggered DiD approach is well suited to analyzing settings that have multiple periods and treatment groups, as shown in studies such as Bertrand and Mullainathan (2003) and Jiang (2018). However, recent developments in econometric theory highlight potential bias because of treatment effect heterogeneity in staggered treatment designs (Baker, Larcker, and Wang (2022)). To address this concern, we adopt a 2-stage approach following Gardner (2022) to ensure the robustness of our estimation of the average treatment effect in our research.

To account for the potential influence of work connections between prefectural and provincial officials stemming from shared professional backgrounds, we introduce the variable *Workties* into the model. The interaction term *Workties*× *Incumbent* signifies whether incumbent prefectural officials had prior employment within the same branch of the Communist Party of China or government as an incumbent provincial leader before assuming their current positions.[14] Likewise, the main effects of *Workties* and *Incumbent* are excluded from the model. To address potential bias related to university ranking, we

[12]To measure corporate investment, we adopt the same capital expenditure calculation as Chen, Sun, Tang, and Wu (2011), which is comparable to Compustat Item 128, which is commonly used in studies of the United States (Almeida and Campello (2007); Gulen and Ion (2016)). This measure captures cash expenditures on capital assets and is a widely accepted proxy for corporate investment. In addition, we conduct robustness tests using gross investment expenditures to ensure the robustness of our results.

[13]In accordance with the literature (Wang and Xu (2008)), we classify political leaders as in their first year of tenure if they take office by the end of May and as in their last year of tenure if they leave office after May.

[14]Hometown ties (*Hometies*× *Incumbent*) are considered as an indicator of shared hometown between incumbent prefectural and provincial leaders. However, its inclusion in the regression model does not substantially alter the baseline results (see Table B6 in Supplementary Material Appendix B). Given that *Hometies* occurs infrequently in our observations, it is omitted from the subsample regressions and not included in the final regression model.

include two dummy variables, *University985* and *University211*, in our regression model, indicating whether a prefectural official attended a Project 985 or a Project 211 university, respectively.[15] This control helps mitigate any potential influence of the reputation of prefectural officials' alma mater on the prefectures' corporate investments. In addition, to account for prefectural officials' varied performance incentives during tenure periods, we include an indicator (*Earlytenure*) to differentiate officials who are in the early tenure period from those in the late tenure period.[16]

To account for firm characteristics that could influence corporate investment behavior (Chen et al. (2011), Duchin and Sosyura (2012)), we include the following variables in equation (1): investment opportunities (*TQ*), net operating cash flow (*CFO*), financial leverage (*Lev*), cash proceeds from equity offerings (*Equityfin*), firm size (*Size*), state ownership (*SOE*), and managerial political connections (*PC*). In addition, we control for prefectures' gross domestic product (*GDP*) per capita to capture economic conditions that might influence local corporate investments. All control variables are lagged by 1 year, and continuous variables are winsorized at the first and 99th percentiles to address outlier effects. For a comprehensive description of these variables, please refer to Table A1 in the Supplementary Material.

C. Firm Matching

To address endogeneity concerns and account for inherent firm and regional characteristics, we apply propensity score matching to generate a matched sample of firms. In the initial stage of propensity score matching, we calculate the propensity score, which represents the conditional probability that a firm is situated in a treatment prefecture (*Schoolties* = 1), using all control variables outlined in equation (1) (Shipman, Swanquist, and Whited (2017)). We then use 1:1 nearest-neighbor matching without replacement, within the same industry and year, to obtain a firm-matched sample consisting of 10,848 observations.[17]

D. Descriptive Statistics

Panel A of Table 1 displays the annual distribution of connected prefectural governments throughout the entire sample period (2003–2018). The percentage of

[15]Project 985 and Project 211 are Chinese government initiatives to develop world-class universities. They select elite institutions, and Project 985 universities are considered superior to Project 211 universities. Currently, there are 39 Project 985 universities and 112 Project 211 universities.

[16]Following the existing literature (e.g., Jiang (2018)), which commonly classifies officials' tenure length into four groups—"less than 1 year," "between 1 and 3 years," "between 3 and 5 years," and "more than 5 years," we define "no more than 3 years" as "early tenure period" and "more than 3 years" as "late tenure period."

[17]We also conduct firm matching within the same industry, the same year, and the same province to further ensure the comparability of sample firms. Adding a province dimension in the matching process results in a much smaller sample size, which is insufficient for further analyses. Therefore, we do not include a province dimension here but report the result as one of the robustness tests in Supplementary Material Appendix B, Table B4.

TABLE 1

Descriptive Statistics for School Ties

In Table 1, *Schoolties* × *Incumbent* indicates the connection status of a government.

Panel A. Prefectural Governments With and Without School Connections

Year	*Schoolties* × *Incumbent* = 1	*Schoolties* × *Incumbent* = 0	Total	Percentage
2003	9	144	153	5.88
2004	10	143	153	6.54
2005	14	154	168	8.33
2006	16	152	168	9.52
2007	14	151	165	8.48
2008	20	180	200	10.00
2009	18	171	189	9.52
2010	13	167	180	7.22
2011	11	193	204	5.39
2012	6	219	225	2.67
2013	9	231	240	3.75
2014	13	241	254	5.12
2015	16	247	263	6.08
2016	14	237	251	5.58
2017	17	266	283	6.01
2018	20	254	274	7.30
Total	220	3,150	3,370	6.53

Panel B. Top 10 Institutions with the Most Connected Province–Prefecture Official Pairs (n = 240)

Rank	Institution	Percentage
1	Jilin University (吉林大学)	20.83
2	Lanzhou University (兰州大学)	19.17
3	Peking University (北京大学)	12.92
4	Renmin University of China (中国人民大学)	11.67
5	Tsinghua University (清华大学)	6.67
6	University of Chinese Academy of Social Sciences (中国社会科学院)	4.17
7	Southwestern University of Finance and Economics (西南财经大学)	3.75
8	Fudan University (复旦大学)	3.33
9	Xiamen University (厦门大学)	2.08
10	Shandong University (山东大学)	2.08

connected prefectures ranges from 2.67% to 10.00%. The average is 6.53% across all prefecture-year observations. The significant year-to-year variation in the distribution further supports the exogeneity and randomness of the connections between provincial and prefectural governments based on school ties.

Panel B of Table 1 presents the distribution of the top 10 academic institutions that have the highest number of connected province–prefecture official pairs. A total of 240 connected official pairs are identified, exceeding the 220 connected prefecture-year observations, indicating that some prefectures have more than one connected official pair in some years. The 3 universities that have the most connected official pairs are Jilin University, Lanzhou University, and Peking University, which collectively account for 52.92% of all connection cases. These top 10 institutions are geographically diverse across China, further confirming the exogeneity and randomness of our measure of connections.

Panel A of Table 2 provides the summary statistics for all variables used in the baseline regression.[18] The treatment group, consisting of firms in prefectures connected to provincial authorities, accounts for 50.0% of the sample. Current province–prefecture connections represent only 6.0% of the entire sample.

[18]To maintain conciseness in the main text, the summary statistics for the nonmatched sample are presented in Table B1 the Supplementary Material.

TABLE 2

Summary Statistics

Panel A of Table 2 presents the summary statistics for all variables in the matched sample, while those for the nonmatched sample are provided in Table B1 in the Supplementary Material. All continuous variables in are winsorized at the 1% level. Panel B of Table 2 compares the characteristics of firms registered in unconnected and connected prefectures. Means and standard deviations (in parentheses) for each variable are reported in columns 1 and 4 for control firms and in columns 2 and 5 for treatment firms. Columns 3 and 6 report the differences between the two groups and *t*-statistics (in parentheses). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Detailed variable descriptions are provided in Supplementary Material Appendix A.

Panel A. Summary Statistics for Key Variables

Variable	N	Mean	SD	P1	P25	Median	P75	P99
Invest	10,848	0.027	0.061	−0.074	−0.007	0.009	0.044	0.294
Schoolties	10,848	0.500	0.500	0.000	0.000	0.500	1.000	1.000
Incumbent	10,848	0.060	0.238	0.000	0.000	0.000	0.000	1.000
Workties	10,848	0.288	0.453	0.000	0.000	0.000	1.000	1.000
University985	10,848	0.815	0.388	0.000	1.000	1.000	1.000	1.000
University211	10,848	0.902	0.298	0.000	1.000	1.000	1.000	1.000
Earlytenure	10,848	0.957	0.204	0.000	1.000	1.000	1.000	1.000
TQ	10,848	2.790	2.142	0.899	1.452	2.087	3.287	13.417
CFO	10,848	0.050	0.089	−0.223	0.005	0.047	0.095	0.351
Lev	10,848	0.434	0.215	0.050	0.263	0.427	0.592	0.952
Equityfin	10,848	0.075	0.299	0.000	0.000	0.000	0.000	1.885
Size	10,848	21.767	1.145	19.363	20.926	21.678	22.473	24.934
SOE	10,848	0.388	0.487	0.000 s	0.000	0.000	1.000	1.000
PC	10,848	0.451	0.498	0.000	0.000	0.000	1.000	1.000
GDP	10,848	12.932	14.044	0.760	3.812	7.927	16.488	68.241

Panel B. Comparison of Firm Characteristics Pre- and Post-Match

	Nonmatched Sample			Firm-Matched Sample		
	Schoolties = 0	*Schoolties* = 1	Difference	*Schoolties* = 0	*Schoolties* = 1	Difference
	(1)	(2)	(3)	(4)	(5)	6
Invest	0.0283 (0.0630)	0.0270 (0.0637)	0.0012 (1.13)	0.0264 (0.0594)	0.0273 (0.0629)	0.0034 (1.38)
Workties	0.2870 (0.4524)	0.2770 (0.4475)	0.0100 (1.31)	0.2895 (0.4536)	0.2863 (0.4521)	0.0031 (0.36)
University985	0.7661 (0.4234)	0.7881 (0.4087)	−0.0221*** (−3.12)	0.8140 (0.3892)	0.8158 (0.3877)	−0.0018 (−0.25)
University211	0.8963 (0.3115)	0.8931 (0.3090)	0.0032 (0.62)	0.9006 (0.2992)	0.9028 (0.2962)	0.0034 (−0.39)
Earlytenure	0.8912 (0.3048)	0.9439 (0.2302)	−0.0527*** (−11.22)	0.9572 (0.2024)	0.9561 (0.2048)	0.0011 (0.28)
TQ	2.8200 (2.2071)	2.7494 (2.1000)	0.0706* (1.93)	2.8059 (2.1871)	2.7737 (2.0960)	0.0322 (0.78)
CFO	0.0491 (0.0917)	0.0516 (0.0922)	−0.0025 (−1.60)	0.0497 (0.0871)	0.0510 (0.0905)	0.0012 (−0.76)
Lev	0.4451 (0.2168)	0.4413 (0.2178)	0.0038 (1.04)	0.4328 (0.2128)	0.4354 (0.2169)	−0.0026 (−0.62)
Equityfin	0.0814 (0.3183)	0.0781 (0.3106)	0.0034 (0.63)	0.0721 (0.2871)	0.0783 (0.3100)	−0.0062 (−1.09)
Size	21.6711 (1.1408)	21.7779 (1.1636)	−0.1068*** (−5.47)	21.7689 (1.1408)	21.7654 (1.1496)	0.0035 (0.16)
SOE	0.4435 (0.4968)	0.3945 (0.4888)	0.0490*** (5.86)	0.3984 (0.4896)	0.3770 (0.4847)	0.0214 **(2.29)
PC	0.4748 (0.4994)	0.4449 (0.4970)	0.0298*** (3.53)	0.4578 (0.4983)	0.4451 (0.4970)	0.0127 (1.33)
GDP	9.4397 (10.4252)	15.4404 (16.5462)	−6.0007*** (−26.01)	10.8069 (11.4974)	15.0576 (15.9150)	−4.2507*** (−15.95)
No. of obs.	7,515	6,466	–	5,424	5,424	–

Table 2, Panel B compares the characteristics of the treatment and control groups. No significant differences in investment levels exist between the treatment and control firms, before and after matching. However, as shown in column 3 of Panel B, the treatment prefectures exhibit significantly lower levels of economic development, as indicated by GDP per capita, than the control prefectures. The treatment and control firms also display significant differences in prefectural officials' educational background, tenure period, Tobin's Q, firm size, state ownership, and PC. By employing firm matching, most of these differences between the treatment and control groups are mitigated, as demonstrated in column 6 of Panel B, except for the significant differences in state ownership and GDP per capita.[19]

[19]The significant differences between the treatment and control groups in various aspects are unlikely to pose an identification problem for causality. The characteristics of prefectures and firms are unlikely to be endogenously correlated with changes in the connection indicator, which is influenced by exogenous political turnover and the random occurrence of school ties.

IV. The Quantity Effect of Politicians' Patronage on Corporate Investment

A. Baseline Results

Column 1 of Table 3 presents the baseline results for the effect of prefectural officials' patronage connections with provincial leaders on local corporate investments. The results are consistent for the nonmatched sample and the firm-matched sample. To keep the main text concise, we provide the firm-matched results here and the nonmatched results in Table B2 in the Supplementary Material. The coefficients of *Schoolties*× *Incumbent* show a positive and

TABLE 3

Effect of Politicians' Patronage Networks on Corporate Investments: Full Sample

Table 3 presents the baseline regression results of the effect of politicians' patronage networks on corporate investments using the full sample. Column 1 shows the propensity score matching results at the firm level. Columns 2 and 3 show the regression results for manufacturing and nonmanufacturing firms. Empirical *p*-values are determined using Fisher's permutation test and indicate whether the differences in the coefficients of *Schoolties* × *Incumbent* between the two subsamples are statistically significant. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (given in parentheses) are based on standard errors clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Variable		Manufacturing	Nonmanufacturing
	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$
	(1)	(2)	(3)
$Schoolties_t \times Incumbent_t$	0.0087***	0.0097***	−0.0033
	(2.68)	(2.66)	(−0.58)
$Workties_t \times Incumbent_t$	0.0016	0.0030	−0.0044
	(0.99)	(1.58)	(−1.31)
$University985_t$	−0.0006	−0.0005	−0.0048
	(−0.22)	(−0.17)	(−0.71)
$University211_t$	−0.0034	−0.0040	0.0052
	(−0.90)	(−0.99)	(0.47)
$Earlytenure_t$	−0.0087***	−0.0078**	−0.0152
	(−2.64)	(−2.24)	(−1.40)
TQ_t	0.0014**	0.0016**	0.0003
	(2.16)	(2.08)	(0.29)
CFO_t	0.0433***	0.0455***	0.0328**
	(4.97)	(4.31)	(2.13)
Lev_t	−0.0606***	−0.0594***	−0.0645***
	(−7.57)	(−6.40)	(−3.85)
$Equityfin_t$	0.0154***	0.0153***	0.0156*
	(4.42)	(4.00)	(1.77)
$Size_t$	−0.0072***	−0.0086***	−0.0046
	(−3.56)	(−3.32)	(−1.36)
SOE_t	−0.0022	−0.0022	−0.0133**
	(−0.35)	(−0.30)	(−2.12)
PC_t	−0.0013	0.0009	−0.0075*
	(−0.64)	(0.37)	(−1.94)
GDP_t	0.0001	0.0001	−0.0000
	(1.08)	(0.88)	(−0.14)
Constant	0.2126***	0.2409***	0.1741**
	(4.87)	(4.31)	(2.23)
Year fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
No. of obs.	10,848	8,858	1,990
Adjusted R^2	0.320	0.321	0.347
Empirical *p*-value	–	0.000	

significant relationship, indicating that firms invest more when there are patronage connections between prefectural and provincial officials. The effect is economically significant: the average increase in investment expenditures is 32.46%.[20] Work connections with provincial leaders also yield a positive but statistically insignificant impact on corporate investments. The educational background of prefectural officials (Project 985 or Project 211) does not significantly influence firm investment. Prefectural officials in the early period of their tenure have significantly lower levels of corporate investment. This may be explained by two reasons. First, higher levels of political uncertainty during an official turnover year can inhibit corporate investment (An, Chen, Luo, and Zhang (2016), Chen, Mao, and Feng (2020)). Second, officials may make more efforts to promote corporate investment for promotion incentives in the late period of their tenure (Feldman, Kang, and Saxena (2021), Lyu, Wang, Zhang, and Zhang (2018)). We also find that smaller firms that have more investment opportunities, higher net operating cash flow, lower financial leverage, and more equity-offering proceeds exhibit higher levels of investment, consistent with the existing literature. The results of the 2-stage estimation, following Gardner (2022), confirm that the estimated treatment effect is robust to potential bias caused by staggered DiD empirical design. Further details and test results are available in Table B3 of the Supplementary Material.

Columns 2 and 3 of Table 3 provide additional insights into the impact of politicians' patronage networks on investments for manufacturing and nonmanufacturing firms.[21] Manufacturing firms exhibit a statistically significant and larger coefficient for the connection indicator than nonmanufacturing firms, suggesting that the effect of politicians' patronage networks on corporate investments is stronger for the manufacturing sector.[22] This finding aligns with that of Jiang (2018), who observes that government guidance and support are more crucial for industrial firms.

1. Parallel Trends Assumption Test

A key assumption in our DiD estimation approach is that local corporate investment trends are similar between connected and unconnected prefectures without patronage establishment. To test this assumption and address endogeneity concerns, we include interactions between *Schoolties* and year dummies in our analysis. Figure 1 presents the estimators for these interactions, showing the dynamic trends of corporate investments in connected and unconnected prefectures. The pattern observed in the figure suggests that local corporate investments in

[20]The average investment expenditure for the firm-matched sample is 0.0268. A connection between a prefectural and provincial government increases local firms' investment expenditures by 0.0087; thus, the level of economic significance is $0.0087/0.0268 \approx 0.3246$.

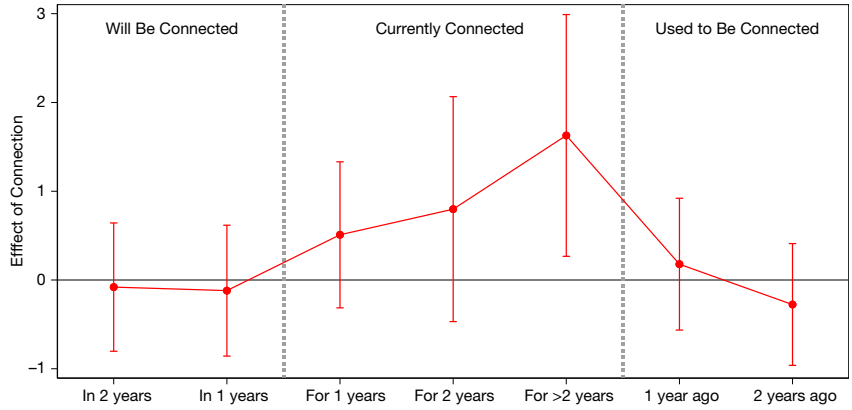
[21]Manufacturing firms are classified according to the first letter of their industrial classification code in line with the industrial classification code document released by the China Securities Regulatory Commission in 2012 (see http://www.csrc.gov.cn/pub/newsite/scb/ssgshyfljg/201304/t20130402_223007.html); specifically, we classify "B. Mining," "C. Manufacturing," "D. Electric power, gas and water production and supply," and "E. Construction" into the manufacturing sector.

[22]Following Cleary (1999), we calculate empirical *p*-values determined by Fisher's permutation test for all subsample regressions to confirm whether the differences in coefficient magnitudes are statistically significant. The results are generally consistent with our arguments.

FIGURE 1

Dynamic Changes in Corporate Investments in Connected Prefectures

Figure 1 shows the dynamic effects of prefectural officials' patronage connections to provincial leaders on corporate investments. Each circle indicates a point estimate; vertical bars represent 95% confidence intervals.



connected prefectures significantly increase after the appointment of connected officials, and this effect diminishes when the connection is lost because an official leaves office.[23] This finding provides further evidence of the causal effect of prefectural officials' patronage connections on local corporate investments.

2. Robustness Tests

We conduct a series of robustness tests to further validate the baseline results. First, to account for unobservable factors related to prefectural characteristics, we add the province dimension into the firm-matching process and match firms within the same industry, the same year, and the same province. We also construct a prefecture-matched sample by matching treatment prefectures with control prefectures in the same province and year according to the closest average GDP per capita over the past 5 years. Second, we consider the possibility of hometown favoritism by excluding observations of provincial leaders' hometown prefectures. Third, we incorporate hometown ties between provincial and prefectural officials as control variables. Fourth, we exclude observations where the provincial patrons of prefectural officials have been promoted to higher positions in the central government. The regression results, reported in Tables B4–B7 in the Supplementary Material, provide further assurance that our results are not driven by omitted variables.

We further modify the measurement of key variables to account for potential measurement errors. First, we adjust the dependent variable by considering gross investment expenditures without subtracting depreciation and amortization. Second, we adjust the measurement of certain control variables, such as extending the time windows in defining *Workties* and using different methods to calculate Tobin's Q. The results, reported in Tables B8–B10 in the Supplementary Material, demonstrate the robustness of our findings to these measurement changes.

[23]In Figure 1, only the coefficient of the indicator for being connected for more than 2 years is significantly different from 0 at the 5% level. This pattern resembles Jiang's (2018) finding.

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B. Clean Sample Analyses

The baseline results presented in Section IV.A may be subject to two potential endogeneity concerns. The first pertains to the potential impact of the preferential appointment decisions of provincial patrons. If connected prefectural officials are deliberately placed in rapidly developing prefectures, as suggested by G. Xu (2018), it could lead to an overestimation of the effect of patronage networks on corporate investment.[24] The second concern involves the turnover of prefectural officials, which could significantly influence local firms' investment decisions, confounding the observed effect of politician's patronage on corporate investment. To address these concerns, we further refine our analysis by focusing only on prefectures' patronage connections established through the turnover of provincial leaders.[25] We restrict the sample to officials who had served as prefectural officials before their provincial superiors took office and use this clean sample for all subsequent analyses. The results for the clean sample, reported in Table 4, show that firms in connected prefectures experience a 29.85% increase in investment expenditures, which remains generally consistent with the finding in Table 3, confirming that politicians' patronage connections increase local firms' investment.

C. Cross-Sectional Analyses

1. Alumni Network Strength

In this section, we examine how the corporate outcomes of these connections vary with alumni network strength. If school ties drive the patronage effect in our research, stronger ties should amplify this effect. We measure alumni network strength in two ways. The first measure is the geographical distance between the residence of connected officials and their shared alma mater (*Geographic Distance*). We expect that the geographical distance is negatively correlated with the strength of school identity for two reasons. First, living close to one's university increases exposure to information about the institution, thus enhancing the sense of school identity, even after graduation. Second, alumni networks tend to be more active and concentrated in areas near the alma mater, and have more alumni events and clubs.[26] The second measure is the alumni engagement level of a university (*Alumni Engagement*), which largely reflects the activity of its alumni community. We use the amount

[24]Our parallel trends test in Section IV.A.1 largely excludes the possibility that connected prefectures exhibit significant differences in investment growth prior to the entry of connected prefectural officials. This suggests that provincial leaders do not systematically assign connected officials to localities that have already higher investment growth. However, there is still a possibility of selection bias if provincial leaders have superior information about future investment levels in a prefecture.

[25]This clean sample also excludes prefectural officials who maintain patronage connections throughout their entire tenure, thus helping to eliminate the possibility that connected prefectural officials might possess superior abilities compared with their unconnected counterparts.

[26]For example, to support the notion that more alumni reside in areas surrounding their alma mater, we can refer to the geographic employment distribution in the 2021 graduation employment report for Peking University (https://scc.pku.edu.cn/news_22e90345837d28bc0183f971e6d66877_1.html). In addition, to demonstrate that more alumni events and clubs are concentrated in areas around an alma mater, we can refer to the geographic distribution of alumni clubs for Shanghai Jiao Tong University (https://alumni.sjtu.edu.cn/web/org/diqu?t = 0).

TABLE 4

Effect of Politicians' Patronage Networks on Corporate Investments: Clean Sample

Table 4 presents the baseline regression results of the effect of politicians' patronage networks on corporate investments using the clean sample, which includes only prefectures that gained patronage connections because of provincial leaders' turnover. Column 1 shows the propensity score matching results at the firm level. Columns 2 and 3 show the regression results for manufacturing and nonmanufacturing firms. Empirical *p*-values are determined using Fisher's permutation test and indicate whether the differences in the coefficients of *Schoolties* × *Incumbent* between the two subsamples are statistically significant. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (given in parentheses) are based on standard errors clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Variable		Manufacturing	Nonmanufacturing
	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$
	(1)	(2)	(3)
$Schoolties_t \times Incumbent_t$	0.0080**	0.0081*	−0.0050
	(2.01)	(1.77)	(−0.97)
$Workties_t \times Incumbent_t$	0.0019	0.0037	−0.0058
	(0.66)	(1.05)	(−1.27)
$University985_t$	0.0002	0.0007	−0.0029
	(0.06)	(0.16)	(−0.20)
$University211_t$	−0.0064	−0.0062	0.0070
	(−1.11)	(−1.01)	(0.46)
$Earlytenure_t$	−0.0029	−0.0034	−0.0012
	(−0.75)	(−0.84)	(−0.16)
TQ_t	0.0017	0.0023*	−0.0022
	(1.60)	(1.87)	(−1.22)
CFO_t	0.0393***	0.0419***	0.0432**
	(3.13)	(2.74)	(2.34)
Lev_t	−0.0435***	−0.0456***	−0.0292**
	(−3.74)	(−3.34)	(−2.09)
$Equityfin_t$	0.0177***	0.0144***	0.0332*
	(3.55)	(2.82)	(1.81)
$Size_t$	−0.0082***	−0.0079**	−0.0068
	(−2.85)	(−2.03)	(−1.50)
SOE_t	−0.0136	−0.0151	−0.0114
	(−1.57)	(−1.42)	(−1.25)
PC_t	0.0001	0.0020	−0.0054
	(0.05)	(0.63)	(−1.21)
GDP_t	−0.0000	−0.0000	−0.0004**
	(−0.30)	(−0.02)	(−2.26)
Constant	0.2282***	0.2210***	0.1986*
	(3.68)	(2.66)	(1.92)
Year fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
No. of obs.	5,852	4,864	988
Adjusted R^2	0.294	0.301	0.339
Empirical *p*-value	–	0.149	

of alumni donations as a proxy for alumni engagement. More prestigious universities often have wealthier alumni, naturally leading to a larger number of alumni donations. To reduce such bias, we compare the number of alumni donations with the prestige of the universities.[27] Specifically, we rank all sample universities according to their prestige and total alumni donations separately. Level of alumni engagement is considered high when the alumni donation rank exceeds the prestige rank.[28]

[27]Using absolute alumni donation numbers without considering university prestige obtains similar results, as reported in Supplementary Material Table B11.

[28]The prestige ranking is comprehensively determined by whether a university belongs to the 985 Project list or the 211 Project list, and the influence of its business school.

TABLE 5

Cross-Sectional Analyses

In columns 1 and 2 of Panel A of Table 5, *Geographic Distance* is the sum of the geographical distance from the cities in which the provincial and prefectural leaders work to the city in which the alma mater is located. In columns 3 and 4 of Panel A, *Alumni Engagement* is measured according to alumni donation. High donation represents that the alumni donation rank of a university is higher than its prestige rank. In columns 1 and 2 of Panel B, *In-group Collectivism* is measured according to the collectivist culture index obtained from Zhao et al.'s (2015) survey of provincial cultural variations in China. *Social Trust* is measured at the provincial level according to the 2001 Chinese Enterprise Survey. In both panels, empirical *p*-values are determined using Fisher's permutation test and indicate whether the differences in coefficients of *Schoolties* × *Incumbent* between the two subsamples are statistically significant. The results for control variables are compressed to save space. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (in parentheses) are based on standard errors clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Moderating Effect of Alumni Network Strength

	Geographic Distance		Alumni Engagement	
	< Median	> Median	High Donation	Low Donation
	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$
Variable	(1)	(2)	(3)	(4)
$Schoolties_t \times Incumbent_t$	0.0145**	0.0004	0.0182**	0.0043
	(2.42)	(0.09)	(2.07)	(1.04)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
No. of obs.	5,387	5,427	5,475	5,754
Adjusted R^2	0.286	0.296	0.301	0.299
Empirical *p*-value	0.000		0.000	

Panel B. Moderating Effect of Collectivism Culture and Social Trust

	In-Group Collectivism		Social Trust	
	< Median	> Median	< Median	> Median
	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$
Variable	(1)	(2)	(3)	(4)
$Schoolties_t \times Incumbent_t$	0.0027	0.0167**	0.0148**	0.0025
	(0.58)	(2.21)	(2.35)	(0.47)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
No. of obs.	2,556	3,296	3,047	2,805
Adjusted R^2	0.338	0.262	0.268	0.312
Empirical *p*-value	0.000		0.003	

A stronger sense of shared school identity is expected when alumni reside closer to their alma mater or when the level of alumni engagement of the alma mater is high. Consistent with our expectations, the regression results, as reported in columns 1 to 4 of Table 5, Panel A, indicate that the effect of local officials' patronage connections is stronger when the connected official pairs live closer to their alma mater or when the level of alumni engagement is high.

2. Collectivist Culture and Social Trust

Collectivism refers to the degree to which individuals are integrated into a group and value their group membership. In highly collectivist cultures, individuals strongly identify with their social groups and maintain close relationships with other group members (Itim International (2007)). We hypothesize that in provinces in which a collectivist culture prevails, the social identity motive of connected officials is stronger. We obtain data on provincial in-group collectivism from a

survey conducted by Zhao, Li, and Sun (2015).[29] The sample is divided into high- and low-collectivism groups using the median value of the in-group collectivism indices as the cutoff.

Social trust refers to the expectation that individuals will behave in a trustworthy and mutually beneficial manner, fostering stronger relationships and increased cooperation (Cook (2001)). In organizations, higher levels of trust facilitate cooperation among members and the achievement of shared goals (Hardin (2001)). In contrast, cultures characterized by lower levels of social trust tend to rely more on informal channels to resolve trust issues (Bedendo, Garcia-Appendini, and Siming (2020)). Thus, social connections become particularly important in contexts that have lower levels of social trust. We assess the level of social trust at the provincial level in China according to managers' responses about the trustworthiness of enterprises in each province, sourced from the 2001 Chinese Enterprise Survey.[30]

We argue that provincial cultural measures are appropriate for our research for two reasons. First, even though provincial leaders serve in nonhome provinces, they are expected to acclimatize to the organizational culture through learning and behavioral adjustment. Enculturation occurs naturally through homophily and peer influence, leading newcomers to culturally align with their colleagues (Srivastava, Goldberg, Manian, and Potts (2018)). Second, most prefectural officials serve in their home provinces, and the influence of patronage networks based on school ties on their promotion incentives largely depends on how they perceive and value these connections. Thus, local culture at the provincial level significantly shapes interactions between prefectural officials and provincial leaders.

As shown in columns 1 to 4 of Table 5, Panel B, we find that the effect of politicians' patronage networks is stronger in provinces with high in-group collectivism and low social trust. The former supports the idea that the patronage effect is driven by politicians' social identity motive. The latter indicates the importance of patronage connections in trust building and cooperation among politicians across hierarchical levels.

[29]Zhao et al. (2015) gathered cultural dimension data for 31 provinces and municipalities in China using a cultural customs questionnaire in accordance with the Global Leadership and Organizational Behavior Effectiveness Project (House, Hanges, Javidan, Dorfman, and Gupta (2004)). The data were collected from a sample of 3,690 constant inhabitants and 5 experts. The survey result has been widely cited by many studies, such as Wei, Kang, and Wang (2019). In-group collectivism is defined as "the degree to which individuals express pride, loyalty, and cohesiveness in their organizations or families" (Grove (2005), p. 6).

[30]In this survey, questionnaires were sent to over 15,000 managers in 31 provinces of China to measure regional culture variables, including social trust. These variables were based on a single-year survey, but culture variables tend to change slowly over time. The survey asked managers to rank the top 5 provinces in which enterprises are deemed most trustworthy, drawing from their own experiences. The resulting provincial social trust score reflects the weighted average trustworthiness ranking provided by managers; higher values indicate higher levels of trust. Prior studies, such as Wu, Firth, and Rui (2014), have used similar survey results to analyze the impact of provincial social trust on economic activities.

V. Mechanism Analyses

A. Promotion Incentives of Prefectural Officials

We argue that politicians' patronage networks encourage subordinate officials to work harder in exchange for rewards from their leaders. To examine whether higher corporate investments are a result of this exchange within patronage networks, we use promotion as a proxy for political rewards. Specifically, we focus on prefectural officials who are promoted by their provincial leaders and define a promotion indicator (*Promotion*) as 1 if a prefectural mayor or party secretary is promoted after leaving their position, and 0 otherwise.[31] We then regress corporate investments on politicians' patronage networks separately for subsamples with *Promotion* values of 1 and 0. For connected prefectures in which both the connection indicator (*Schoolties*×*Incumbent*) and the promotion indicator (*Promotion*) are 1, we only retain cases in which officials are promoted to a higher position within the province while their connected provincial leader is still in power. This ensures that these officials were likely promoted by their connected superiors. The results, presented in columns 1 and 2 of Table 6, indicate that the effect of patronage connections on corporate investments is stronger when connected prefectural officials are promoted by their provincial leaders after leaving their positions. We also adopt the age of prefectural officials as a proxy for their promotion prospects, following the approach by Lyu et al. (2018). Specifically, prefectural officials below the age of 55 tend to have more opportunities for promotion, whereas those aged 55 and above typically face more limited prospects for advancement. As shown in columns 3 and 4 of Table 6, our results indicate that the influence of patronage connections on corporate investments becomes significantly more pronounced when connected prefectural officials fall into the under-55 category. These findings support our argument that network-induced promotion incentives drive prefectural officials to promote investments by local firms.

To further examine the link between local firms' investments and prefectural officials' promotion incentives, we analyze the effect of politicians' patronage networks on the geographical distribution of firms' business activities. We measure a firm's operational presence in a prefecture using the number of subsidiaries, joint ventures, and associate companies located there. Specifically, we investigate how changes in the connection status of prefectural officials correspond to variations in firms' operational activities. The dependent variable *Invest* is replaced with *Inv_register*, which represents the proportion of a firm's affiliated companies located in its registered prefecture. To account for differences in market protectionism across provinces, we conduct prefecture matching and firm matching within the same province and year for the control group. The regression results in columns 5 and 6 of Table 6 show that the coefficients of *Schoolties*×*Incumbent* are significant and positive at the 10% level for the prefecture-matched and firm-matched samples, indicating that firms located in connected prefectures have a higher concentration of business activities in those prefectures. These findings

[31]Following the literature (Jia et al. (2015)), we also consider a mayor appointed as a party secretary of a prefecture as having been promoted, even though the mayor and party secretary of a prefecture are at the same administrative level.

TABLE 6

Moderating Effect of Promotion Incentives and Geographic Distribution of Corporate Investments

Columns 1 to 4 in Table 6 show the moderating effect of prefectural officials' promotion incentive on the effect of patronage connections between provincial and prefectural officials. Empirical *p*-values are determined using Fisher's permutation test and indicate whether the differences in coefficients of *Schoolties* × *Incumbent* between the two subsamples are statistically significant. Columns 5 to 6 present the effect of politicians' patronage networks on the geographic distribution of corporate investments. The dependent variable *Inv_register* represents the ratio of business activities taking place in the firm's registered prefecture. It is proxied by the proportion of affiliated companies located in the firm's registered prefecture. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (in parentheses) are based on standard errors clustered by firm. *, **, and *** show significance at the 10%, 5%, and 1% levels, respectively.

	Promotion = 0	*Promotion* = 1	*Prefecture_age* < 55	*Prefecture_age* ≥ 55	Prefecture-Matched	Firm-Matched
	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$	$Inv\_register_{t+1}$	$Inv\_register_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$Schoolties_t$ ×	0.0008	0.0272***	0.0035	0.0135**	0.0291**	0.0271**
$Incumbent_t$	(0.18)	(2.91)	(0.52)	(2.03)	(2.44)	(2.19)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	2,271	3,487	1,645	4,207	4,327	3,968
Adjusted R^2	0.398	0.326	0.478	0.286	0.781	0.786
Empirical *p*-value	0.000		0.082		–	

support our argument that network-induced promotion incentives contribute to the increased investments of local firms.

B. Channels of Prefectural Government Influence

If prefectural government contributes to increased corporate investment, we expect that this effect is stronger among firms that are more vulnerable to prefectural government influence. We classify our sample firms into four groups according to the extent of the prefectural government's influence on their decisions. Columns 1 to 4 in Table 7 show that the impact of politicians' patronage on corporate investment diminishes as the influence of the prefectural government decreases. The results indicate that the investment increases the most for prefectural state-owned enterprises, followed by private firms with PC, whereas the investment of provincial and central state-owned enterprises and private firms without PC does not increase significantly.

In addition, the prefectural government can influence corporate decisions more readily when politicians' patronage networks extend into firms. Therefore, we anticipate a stronger patronage effect for firms whose chair or CEO shares school ties with the connected prefectural officials. Columns 5 and 6 of Table 7 document that the coefficient of the connection indicator is significantly larger when corporate leaders are also embedded in politicians' alumni networks. These findings highlight another possible channel through which politicians' patronage networks exert influence on corporate investment decisions.

C. Government Policy Support

We then examine whether connected prefectural governments have provided local firms with any benefits, possibly supported by material resources or policy favors from their provincial patrons, to directly promote local firms' investment. As reported in columns 1 to 3 of Table 8, we find that firms in connected prefectures

TABLE 7

Channels of Prefectural Government Influence on Corporate Investments

Columns 1 to 4 in Table 7 show the moderating effect of prefectural government influence on the effect of patronage connections between provincial and prefectural officials. Columns 5 to 6 compare the effect of politicians' patronage networks on corporate investment when corporate leaders are and are not embedded in the politician's patronage networks through common school ties. These two regressions also control the school ties between corporate leaders and unconnected prefectural officials. Empirical *p*-values are determined using Fisher's permutation test and indicate whether the differences in coefficients of *Schoolties* × *Incumbent* between the two subsamples are statistically significant. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (in parentheses) are based on standard errors clustered by firm. *, **, and *** show significance at the 10%, 5%, and 1% levels, respectively.

	Prefectural SOEs	Private Firms with Political Connections	Provincial and Central SOEs	Private firms Without Political Connections	Corporate Leaders are not Embedded	Corporate Leaders are Embedded
	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$	$Invest_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$Schoolties_t \times Incumbent_t$	0.0256**	0.0153**	0.0012	0.0033	0.0065*	0.0244*
	(2.01)	(2.05)	(0.17)	(0.52)	(1.76)	(1.73)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	856	1,374	1,317	1,928	5,668	3,320
Adjusted R^2	0.450	0.306	0.271	0.301	0.302	0.310
Empirical *p*-value	(1) vs. (2): 0.053		(2) vs. (3): 0.019		(5) vs. (6): 0.000	
	(1) vs. (3): 0.000		(2) vs. (4): 0.006			
	(1) vs. (4): 0.000		(3) vs. (4): 0.382			

TABLE 8

Effect of Politicians' Patronage Networks on Government Subsidy, Government-Endorsed Corporate Bond, and Provincial Industrial Park

Table 8 presents the baseline regression results of the effect of politicians' patronage networks on government subsidy, government-endorsed corporate bond, and the area of provincial-level special economic zone. The results for control variables are compressed to save space. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (given in parentheses) are based on standard errors clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Variable	Subsidy	Government-Endorsed Corporate Bond	Provincial-Level Special Economic Zone
	$Subsidy_t$	$Bond_{t+1}$	$Area_{t+2}$
	(1)	(2)	(3)
$Schoolties_t \times Incumbent_t$	0.0082*	0.0035*	0.1866*
	(1.71)	(1.96)	(1.94)
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Firm/prefecture fixed effects	Yes	Yes	Yes
No. of obs.	3,976	2,065	1,655
Adjusted R^2	0.448	0.277	0.157

obtain more government subsidies and issue more government-endorsed corporate bonds.[32] In addition, the area of provincial-level special economic zones in

[32]There are two types of corporate bonds in China. One is approved by China Securities Regulatory Commission. Its issuing process does not involve government intervention. The other is approved by National Development and Reform Commission, whose issuing is controlled by the government. We call the second type "government-endorsed corporate bonds" in our research. Since we can only differentiate the two types of corporate bonds at the prefecture level, we conduct government-endorsed corporate bonds analysis at the prefecture level. Untabulated results show that corporate bond issuing also increases at the firm level, which further confirms our finding here.

connected prefectures expands more rapidly.[33] These findings further link politicians' patronage networks to increased investment by local firms.

VI. The Quality Effect of Politicians' Patronage on Corporate Investment

A. Corporate Investment Efficiency

1. Fewer Financial Constraints and Overinvestment

In this section, we investigate how politicians' patronage networks affect corporate investment efficiency. We begin by examining firms' financial constraints, using the sensitivity of firms' investment to internal cash flow as a proxy, as shown in column 1 of Table 9, Panel A.[34] We find that firms in connected prefectures face lower financial constraints. Prior studies suggest that reduced financing frictions may lead to lower investment efficiency because managers may misuse free cash flow for less valuable investment opportunities (Hovakimian (2011)). Next, we assess the investment efficiency of firms in connected prefectures by analyzing the sensitivity of investment to Tobin's Q (TQ), following the approach commonly used in the corporate finance literature (e.g., Gulen and Ion (2016)). The result in column 2 of Table 9, Panel A, supports the hypothesis that political patronage connections lead local firms to make inefficient investment decisions.

Subsequently, we delve deeper to determine whether the efficiency loss can be attributed to overinvestment by local firms. Following the methodology of Biddle, Hilary, and Verdi (2009), we use a firm's sales growth in year t to forecast its expected investment in year $t + 1$, segmented by industry and year. The residuals from these regressions are then sorted into quartiles. Firm-year observations in the bottom quartile (having the most negative residuals) are categorized as the underinvestment group, whereas those in the top quartile (having the most positive residuals) are classified as the overinvestment group. We then evaluate the impact of prefectural officials' patronage connections on the probability of local firms overinvesting or underinvesting. As displayed in columns 3 and 4 of Table 9, Panel A, political patronage networks are associated with an increased probability of overinvestment by firms in connected prefectures.

[33] Applying for the establishment or extension of special economic zones requires much preparation by the prefectural government and needs to go through a series of complex procedures. See https://swt.fujian.gov.cn/xxgk/flfg/qtx/201904/t20190415_4850736.htm for an example. Consequently, the faster growth of provincial special economic zones lags 2 years after the patronage connection was established. Firms registered in special economic zones enjoy many favorable policies conducive to more investment, such as tax preferences, government subsidies, price discounts in land purchase, bank loan privileges, and fast administrative approvals. The corporate investment begins to increase 1 year after the establishment of the patronage connection. Larger special economic zones can promote corporate investment to increase more 2 years after the establishment of the patronage connection.

[34] We also calculate the financial constraint index following Whited and Wu (2006) as an alternative measure of firms' financial constraints, and the results showing the reduced financial constraints of firms located in connected prefectures remain robust. The results are reported in Supplementary Material Table B12.

TABLE 9

Politicians' Patronage Networks and Corporate Investment Efficiency

Columns 1 and 2 in Table 9 show the influence of politicians' patronage networks on the sensitivity of corporate investment to the operating cash flow and growth opportunities in connected prefectures. Columns 3 and 4 examine the overinvestment and underinvestment of firms located in connected prefectures. Dependent variable *Over* is an indicator that equals 1 when an observation belongs to the overinvesting group. Dependent variable *Under* is an indicator that equals 1 when an observation belongs to the underinvesting group. Columns 5 and 6 present the effect of politicians' patronage networks on the firm's R&D investment (*R&D*) and total factor productivity (*TFP_firm*). The results for control variables are compressed to save space. Panel B presents stock return statistics for firms located in connected and unconnected prefectures at the time of appointment of provincial patrons. The unconnected samples are selected according to matching of industry and size. Abnormal returns are calculated according to parameters estimated over the day −210 to −10 window. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (in parentheses) are based on standard errors clustered by firm. *, **, and *** show significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Firm Efficiency Examinations

	Operating Cash Flow	Growth Opportunities	Overinvestment	Underinvestment	Corporate Innovation	Total Factor Productivity
	$Invest_{t+1}$	$Invest_{t+1}$	$Over_{t+1}$	$Under_{t+1}$	$R\&D_{t+1}$	TFP_firm_{t+1}
Variable	(1)	(2)	(3)	(4)	(5)	(6)
$Schoolties_t \times Incumbent_t$	0.0132**	0.0134***	0.0521**	−0.0362	−0.0016**	−0.0389**
	(2.54)	(2.59)	(2.07)	(−1.36)	(−2.13)	(−2.37)
$Schoolties_t \times Incumbent_t \times CFO_t$	−0.0924**	–	–	–	–	–
	(−2.05)	–	–	–	–	–
$Schoolties_t \times Incumbent_t \times TQ_t$	–	−0.0022*	–	–	–	–
	–	(−1.65)	–	–	–	–
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	5,852	5,852	5,702	5,702	2,379	4,301
Adjusted R^2	0.296	0.295	0.249	0.202	0.651	0.451

Panel B. Market Responses to the Establishment of Patronage Connections Between Provincial and Prefectural Officials

	Market Model			Fama–French 3-Factor Model		
	Connected Sample	Unconnected Sample	Difference	Connected Sample	Unconnected Sample	Difference
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CAR[−2,2]	−0.0050*	0.0026	−0.0076**	−0.0048*	0.0033	−0.0082**
	(−1.84)	(1.15)	(−2.12)	(−1.75)	(1.23)	(−2.12)
CAR[−3,3]	−0.0089***	0.0016	−0.0104**	−0.0066**	0.0044	−0.0110**
	(−2.85)	(0.51)	(−2.29)	(−2.10)	(1.24)	(−2.26)
N	423	423	–	423	423	–

2. Corporate Innovation and Total Factor Productivity

Political intervention can distort corporate investment by discouraging innovation (Ellis, Smith, and White (2020), Huang and Tao (2021)). In this section, we further investigate whether substantial support from connected local governments reduces firms' incentives for innovation, leading to lower research and development (R&D) activities. We replace the investment variable with R&D investment (*R&D*) in column 5 of Table 9 and find that connections between prefectural officials and provincial leaders result in lower R&D investment by local firms. In addition, we estimate a firm's total factor productivity (*TFP_firm*) following the methodologies of To, Navone, and Wu (2018) and Giannetti, Liao, and Yu (2015) to examine how patronage networks affect productivity. The results in column 6 of Table 9 indicate that firms in connected prefectures exhibit lower total factor productivity. These findings are consistent with our prior evidence of reduced investment efficiency and support the argument that politicians' patronage networks distort firms' internal capital allocation, undermining firm investment efficiency.

3. Stock Market Reactions

We have demonstrated that patronage connections between prefectural officials and their provincial leaders adversely affect the investment efficiency of local firms. To further investigate whether the capital market recognizes this efficiency loss at the time these patronage connections are established, we analyze stock market reactions.

Specifically, we calculate the cumulative abnormal returns (CAR) over 5-day (*CAR [−2,2]*) and 7-day (*CAR[−3,3]*) windows, centered around the appointment day of provincial patrons, for firms in connected prefectures. Each treatment firm is matched with a control firm from an unconnected prefecture within the same province in accordance with industry and size.

The results, presented in Table 9, Panel B, show that regardless of whether we use the market model or the Fama–French 3-factor model, firms in connected prefectures exhibit a negative stock price reaction to the appointment of provincial patrons, and the returns of control firms are not statistically different from zero. These negative stock market reactions further support our findings, reinforcing the conclusion that politicians' patronage networks are detrimental to corporate investment.

B. Prefectural Economic Growth and Efficiency

In this section, we first examine whether increased investment by local firms contributes to the economic growth of connected prefectures. As displayed in columns 1 and 2 of Table 10, we do not find evidence that the GDP of connected prefectures grows significantly faster than that of unconnected ones. However, connected prefectural governments are more likely to meet or exceed the GDP growth target set by the provincial government. We interpret this result as a

TABLE 10

Effect of Politicians' Patronage Networks on Aggregate Economic Growth and Efficiency

In column 1 of Table 10, *GDPgrowth* is the real GDP growth rate of a prefecture. In column 2, *Targetmeet* takes a value of 1 if the prefectural actual GDP growth meets or beats the provincial GDP growth target, and 0 otherwise. The productivity of labor resources (*Productivity_labor*) is measured by industrial economic output per 10,000 employed personnel. The productivity of coal (*Productivity_coal*) is measured by industrial economic output per ton of norm-coal consumption. The productivity of electricity (*Productivity_electricity*) is measured by industrial economic output per 10,000 kW hours of electricity consumption. The results for control variables are compressed to save space. Supplementary Material Appendix A provides detailed variable descriptions. All continuous variables are winsorized at the 1% level. *t*-statistics (given in parentheses) are based on standard errors clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Economic Performance		Economic Efficiency		
Variable	GDP Growth Rate	GDP Growth Target Meeting	Labor Productivity	Energy Productivity	
	$GDPgrowth_{t+2}$	$Targetmeet_{t+2}$	$Productivity\_labor_{t+1}$	$Productivity\_coal_{t+1}$	$Productivity\_electricity_{t+1}$
	(1)	(2)	(3)	(4)	(5)
$Schoolties_t \times Incumbent_t$	−0.4197	0.0675**	−0.3100**	−0.0003**	−0.0019**
	(−1.27)	(2.29)	(−1.99)	(−2.21)	(−2.00)
Prefectural leader controls	Yes	Yes	Yes	Yes	Yes
Prefectural economic controls	Yes	Yes	Yes	Yes	Yes
Province-year fixed effects	Yes	Yes	Yes	Yes	Yes
Prefecture fixed effects	Yes	Yes	Yes	Yes	Yes
No. of obs.	1,951	1,791	1,639	1,768	1,684
Adjusted R^2	0.816	0.053	0.948	0.785	0.664

reflection of enhanced cooperation between prefectural and provincial officials. This coordination enables prefectural officials to meet performance targets using minimal effort. Patronage connections maximize the overall interests of both prefectural and provincial officials but do not incentivize local officials to maximize economic performance.

We then explore the broader economic outcomes of politicians' patronage networks by examining macro-level economic efficiency in connected prefectures. We construct three productivity variables at the prefecture level: labor productivity (*Productivity_labor*) and energy productivity (*Productivity_coal* and *Productivity_electricity*). Definitions of these variables are provided in Supplementary Material Appendix A. The results, presented in columns 3 to 5 of Table 10, reveal that the aggregate economic output of connected prefectures exhibits lower levels of efficiency. These results are consistent with the observed low efficiency at the firm level. In summary, all the results discussed confirm the negative impact of politicians' patronage networks on corporate investment efficiency. It is evident that firms in connected prefectures engage in more inefficient investment decisions.

VII. Conclusion

We examine the impact of politicians' patronage networks on corporate investment by identifying school ties between provincial and prefectural officials in China. Our findings reveal that when prefectural governments are linked to superior provincial governments through these networks, there is a significant increase in local corporate investments, but at the cost of economic efficiency. This rise in investment by local firms is largely driven by the enhanced promotion incentives of prefectural officials. However, while resolving political incentive issues benefits officials, it does not necessarily align with the public interest, ultimately failing to improve social welfare.

Our research has several important implications. First, it highlights the need for managers and investors to consider the broader political factors that may influence a firm's operating environment when making investment decisions. Politicians' patronage networks, which are largely overlooked in the literature, can significantly shape corporate investment policies. Our work offers a novel explanation for regional investment imbalances, in China and globally, through the lens of these political networks. Second, while informal ties within large organizations, such as governments, can help reduce information asymmetry and mitigate agency problems, it is crucial for authorities to be aware of the potential negative consequences of personal connections, such as distorted incentives among subordinates and unbalanced resource allocation. Finally, given that personal interactions among government officials are common across countries, our findings may offer valuable insights for nations beyond China.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109025000067.

Declaration of Conflicts of Interest

None declared.

References

Akerlof, G. A., and R. E. Kranton. "Economics and Identity." *Quarterly Journal of Economics*, 115 (2000), 715–753.

Alchian, A. A., and H. Demsetz. "Production, Information Costs, and Economic Organization." *American Economic Review*, 62 (1972), 777–795.

Almeida, H., and M. Campello. "Financial Constraints, Asset Tangibility, and Corporate Investment." *Review of Financial Studies*, 20 (2007), 1429–1460.

Alok, S., and M. Ayyagari. "Politics, State Ownership, and Corporate Investments." *Review of Financial Studies*, 33 (2020), 3031–3087.

An, H.; Y. Chen; D. Luo; and T. Zhang. "Political Uncertainty and Corporate Investment: Evidence from China." *Journal of Corporate Finance*, 36 (2016), 174–189.

Baker, A. C.; D. F. Larcker; and C. C. Y. Wang. "How Much Should We Trust Staggered Difference-in-Differences Estimates?" *Journal of Financial Economics*, 144 (2022), 370–395.

Bedendo, M.; E. Garcia-Appendini; and L. Siming. "Cultural Preferences and Firm Financing Choices." *Journal of Financial and Quantitative Analysis*, 55 (2020), 897–930.

Bertrand, M., and S. Mullainathan. "Enjoying the Quiet Life? Corporate Governance and Managerial Preferences." *Journal of Political Economy*, 111 (2003), 1043–1075.

Biddle, G. C.; G. Hilary; and R. S. Verdi. "How Does Financial Reporting Quality Relate to Investment Efficiency?" *Journal of Accounting and Economics*, 48 (2009), 112–131.

Brown, J. R., and J. Huang. "All the President's Friends: Political Access and Firm Value." *Journal of Financial Economics*, 138 (2020), 415–431.

Chen, Y., and S. X. Li. "Group Identity and Social Preferences." *American Economic Review*, 99 (2009), 431–457.

Chen, S.; H. Mao; and Z. Feng. "Political Uncertainty and Firm Entry: Evidence from Chinese Manufacturing Industries." *Journal of Business Research*, 120 (2020), 16–30.

Chen, S.; Z. Sun; S. Tang; and D. Wu. "Government Intervention and Investment Efficiency: Evidence from China." *Journal of Corporate Finance*, 17 (2011), 259–271.

Cleary, S. "The Relationship between Firm Investment and Financial Status." *Journal of Finance*, 54 (1999), 673–692.

Cohen, L.; A. Frazzini; and C. Malloy. "Sell-Side School Ties." *Journal of Finance*, 65 (2010), 1409–1437.

Cohen, L., and C. Malloy. "Friends in High Places." *American Economic Journal: Economic Policy*, 6 (2014), 63–91.

Cook, K. S., ed. *Trust in Society.* New York, NY: Russell Sage Foundation (2001).

Duchin, R., and D. Sosyura. "The Politics of Government Investment." *Journal of Financial Economics*, 106 (2012), 24–48.

Ellis, J.; J. Smith; and R. White. "Corruption and Corporate Innovation." *Journal of Financial and Quantitative Analysis*, 55 (2020), 2124–2149.

Faccio, M. "Politically Connected Firms." *American Economic Review*, 96 (2006), 369–386.

Feldman, D.; C.-M. Kang; J. Li; and K. Saxena. "Politically Motivated Corporate Decisions as Tournament Participation/Inclusion Games." *Journal of Corporate Finance*, 67 (2021), 101883.

Fisman, R. "Estimating the Value of Political Connections." *American Economic Review*, 91 (2001), 1095–1102.

Francois, P.; F. Trebbi; and K. Xiao. "Factions in Nondemocracies: Theory and Evidence from the Chinese Communist Party." *Econometrica*, 91 (2023), 565–603.

Gardner, J. "Two-Stage Differences in Differences." Working Paper, available at https://EconPapers.repec.org/RePEc:arx:papers:2207.05943 (2022).

Giannetti, M.; G. Liao; and X. Yu. "The Brain Gain of Corporate Boards: Evidence from China." *Journal of Finance*, 70 (2015), 1629–1682.

Grove, C. N. *Worldwide Differences in Business Values and Practices: Overview of GLOBE Research Findings*. (2005). https://1library.net/document/q5m5dm5w-worldwide-differences-business-values-practices-overview-research-findings.html.

Guan, Y.; L. Su; D. Wu; and Z. Yang. "Do School Ties between Auditors and Client Executives Influence Audit Outcomes?" *Journal of Accounting & Economics*, 61 (2016), 506–525.

Gulen, H., and M. Ion. "Policy Uncertainty and Corporate Investment." *Review of Financial Studies*, 29 (2016), 523–564.
Guo, P.; G. Shi; G. Tian; and S. Duan. "Politicians' Hometown Favoritism and Corporate Investments: The Role of Social Identity." *Journal of Banking & Finance*, 125 (2021), 106092.
Han, L., and J. Kung. "Fiscal Incentives and Policy Choices of Local Governments: Evidence from China." *Journal of Development Economics*, 116 (2015), 89–104.
Hardin, R. "Conceptions and Explanations of Trust." In *Trust in Society*, K. S. Cook, ed. New York, NY: Russell Sage Foundation (2001), 3–39.
Henderson, D. J.; S. J. Wayne; L. M. Shore; W. H. Bommer; and L. E. Tetrick. "Leader-Member Exchange, Differentiation, and Psychological Contract Fulfillment." *Journal of Applied Psychology*, 93 (2008), 1208–1219.
House, R. J.; P. J. Hanges; M. Javidan; P. W. Dorfman; and V. Gupta, eds. *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*. Thousand Oaks, CA: Sage Publications (2004).
Hovakimian, G. "Financial Constraints and Investment Efficiency: Internal Capital Allocation across the Business Cycle." *Journal of Financial Intermediation*, 20 (2011), 264–283.
Huang, Q., and Y. Tao. "Does Political Corruption Impede Firm Innovation? Evidence from the United States." *Journal of Financial and Quantitative Analysis*, 56 (2021), 213–248.
Itim International. "*Geert Hofstede Cultural Dimensions.* (2007).
Jia, R.; M. Kudamatsu; and D. Seim. "Political Selection in China: The Complementary Roles of Connections and Performance." *Journal of the European Economic Association*, 13 (2015), 631–668.
Jiang, J. "Making Bureaucracy Work: Patronage Networks, Performance Incentives, and Economic Development in China." *American Journal of Political Science*, 62 (2018), 982–999.
Jiang, J., and M. Zhang. "Friends with Benefits: Patronage Networks and Distributive Politics in China." *Journal of Public Economics*, 184 (2020), 104143.
Keynes, J. M., *The General Theory of Employment, Interest, and Money*. Cham, Switzerland: Springer International (2018).
La Porta, R.; F. Lopez-De-Silanes; A. Shleifer; and R. W. Vishny. "Trust in Large Organizations." NBER Working Paper No. 5864 (1996).
La Porta, R.; F. Lopez-De-Silanes; and A. Shleifer. "Government Ownership of Banks." *Journal of Finance*, 57 (2002), 265–301.
Lei, Z. "The Political Resource Blessing or Curse? Patronage Networks, Infrastructure Investment, and Economic Development in China." *Comparative Political Studies*, 56 (2023), 1156–1188.
Li, H., and L.-A. Zhou. "Political Turnover and Economic Performance: The Incentive Role of Personnel Control in China." *Journal of Public Economics*, 89 (2005), 1743–1762.
Lyu, C.; K. Wang; F. Zhang; and X. Zhang. "GDP Management to Meet or Beat Growth Targets." *Journal of Accounting & Economics*, 66 (2018), 318–338.
Martin, R.; G. Thomas; A. Legood; and S. Dello Russo. "Leader–Member Exchange (LMX) Differentiation and Work Outcomes: Conceptual Clarification and Critical Review." *Journal of Organizational Behavior*, 39 (2018), 151–168.
Massa, M., and A. Simonov. "Is College a Focal Point of Investor Life?" *Review of Finance*, 15 (2011), 757–797.
McPherson, M.; L. Smith-Lovin; and J. M. Cook. "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology*, 27 (2001), 415–444.
Moon, T., and D. Schoenherr. "The Rise of a Network: Spillover of Political Patronage and Cronyism to the Private Sector." *Journal of Financial Economics*, 145 (2022), 970–1005.
Piotroski, J. D.; T. J. Wong; and T. Zhang. "Political Networks and Stock Price Comovement: Evidence from Network-Connected Firms in China." *Review of Finance*, 26 (2022), 521–559.
Putnam, R. D.; R. Leonardi; and R. Y. Nanetti. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press (1994).
Raymond, C. M.; G. Brown; and D. Weber. "The Measurement of Place Attachment: Personal, Community, and Environmental Connections." *Journal of Environmental Psychology*, 30 (2010), 422–434.
Shi, X.; T. Xi; X. Zhang; and Y. Zhang. "'Moving Umbrella'": Bureaucratic Transfers and the Comovement of Interregional Investments in China." *Journal of Development Economics*, 153 (2021), 102717.
Shipman, J.; Q. Swanquist; and R. Whited. "Propensity Score Matching in Accounting Research." *Accounting Review*, 92 (2017), 213–244.
Srivastava, S.; A. Goldberg; V. Manian; and C. Potts. "Enculturation Trajectories: Language, Cultural Adaptation, and Individual Outcomes in Organizations." *Management Science*, 64 (2018), 1348–1364.

To, T.; M. Navone; and E. Wu. "Analyst Coverage and the Quality of Corporate Investment Decisions." *Journal of Corporate Finance*, 51 (2018), 164–181.
Venkataramani, V.; G. Labianca; and T. Grosser. "Positive and Negative Workplace Relationships, Social Satisfaction, and Organizational Attachment." *Journal of Applied Psychology*, 98 (2013), 1028–1039.
Wang, X., and X. Xu. "Di Fang Guan Yuan Lai Yuan, Qu Xiang, Ren Qi Yu Jing Ji Zeng Zhang—Lai Zi Zhong Guo Sheng Zhang Sheng Wei Shu Ji de Zheng Ju [Effect of Local Officials' Sources, Tenure, and the Whereabouts on Economic Growth]." *Management World*, 3 (2008), 16–26 (in Chinese).
Wei, Y.; D. Kang; and Y. Wang. "Geography, Culture, and Corporate Innovation." *Pacific-Basin Finance Journal*, 56 (2019), 310–329.
Whited, T. M., and G. J. Wu. "Financial Constraints Risk." *Review of Financial Studies*, 19 (2006), 531–559.
Wu, W.; M. Firth; and O. M. Rui. "Trust and the Provision of Trade Credit." *Journal of Banking & Finance*, 39 (2014), 146–159.
Xu, G. "The Costs of Patronage." *American Economic Review*, 108 (2018), 3170–3198.
Xu, X., and S. Li. "Guan Yuan Pian Ai Ji Guan di de Ji Zhi Yan Jiu—Ji Yu Zi Yuan Zhuan Yi de Shi Jiao [A Study of the Mechanism of Leaders' Regional Favoritism Based on the Resource Reallocation Perspective]. *Economic Research*, 54 (2019), 111–126 (in Chinese).
Zhao, X.; H. Li; and C. Sun. "Zhong Guo Qu Yu Wen Hua di Tu: "Da Yi Tong" Yi Huo "Duo Yuan Hua"? [The Regional Cultural Map in China: Is it "the Great Unification" or "the Diversification"?]." *Management World*, 5 (2015), 101–119 (in Chinese).
Zwick, E., and J. Mahon. "Tax Policy and Heterogeneous Investment Behavior." *American Economic Review*, 107 (2017), 217–248.