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Political uncertainty, bank loans, and corporate behavior: New investigation with machine learning

Yilei Qian [a], Feng Wang [b,*,1], Muyang Zhang [b], Ninghua Zhong [c]

[a] Shanghai University of International Business and Economics, 1900 Wenxiang Road, Shanghai, China
[b] Shanghai University of Finance and Economics, 777 Guoding Road, Shanghai, China
[c] Tongji University, 1239 Siping Road, Shanghai, China

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ABSTRACT

This paper investigates how uncertain term length, a novel source of political uncertainty, affects the behaviors of banks and firms using a machine-learning approach. China's local authorities do not have a fixed term, creating an ideal environment for studying how economic agents react to their perception of political uncertainty without an actual political turnover. We implement a machine-learning method to predict the term length of city leaders by observing others with similar backgrounds. Combining this new measurement of political uncertainty and bank- and firm-level data, we find an inverted U-shaped relationship between city leaders' predicted remaining term length and bank loans, corporate liabilities, and investment, which matches the change of political uncertainty over the term. We also record the potential adverse consequences of the politically motivated loan and investment expansion, such as a loss of corporate efficiency and a disruption in market order.

1. Introduction

The impact of political uncertainty on economic agents' decisions has attracted much academic attention (Pástor and Veronesi, 2013; Baker et al., 2016). Political uncertainty originates from a variety of factors, including political strife, political turnover, and policy change. Existing literature has paid sufficient attention to political uncertainty caused by elections (Julio and Yook, 2012; Kelly et al., 2016; Jens, 2017; Honig, 2020), leader's sudden deaths (Jones and Olken, 2005; Faccio and Parsley, 2009; Brogaard et al., 2021), and coups (Alesina and Perotti, 1996; Abadie and Gardeazabal, 2003; Acemoglu et al., 2018). All these incidents include actual leadership turnover.

In this paper, we explore a new aspect of political uncertainty. We focus on political uncertainty where the political leader's term length is uncertain. China's local authorities provide an ideal environment to investigate how economic agents react to uncertain term length. As the literature has noted, political leaders in China's local authorities do not follow a fixed term length (Yao and Zhang, 2015). Based on our hand-collected information of more than 900 top city positions from 2007 to 2015, political turnover among prefecture-level city leaders occurs frequently every year in China, and the average length of time a top city leader served in a position is 3.6 years. Although an exact date of political turnover cannot be accurately forecasted, city leaders and local economic agents share

* Corresponding author.
E-mail addresses: qianyilei@suibe.edu.cn (Y. Qian), fwang@mail.shufe.edu.cn (F. Wang), zhang.muyang@mail.shufe.edu.cn (M. Zhang), zhongninghua@tongji.edu.cn (N. Zhong).
[1] Postal address: Office 207, Fenghuang Bldg., Shanghai University of Finance and Economics, 777 Guoding Road, Shanghai, 200,433, China

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some prior knowledge of how long the city leaders will stay upon their arrival by observing those with similar backgrounds. With this feature, how could political uncertainty be measured? How do economic agents change their decisions regarding the predicted term length and actual time in office?

To answer these questions, we utilize machine-learning algorithms to predict the term length of local leaders. Once we get the predicted term length, we investigate how predicted remaining term length affects financial resources mobilized for economic growth and economic agents' behavior. Existing literature also relates politically motivated financing and investment behavior with political leaders' term length (Ru, 2018; Xiong et al., 2021). Unlike previous research, we use a predicted rather than actual term length to better capture economic agents' priori expectations. We focus on bank loans as a major financial resource, as bank loans account for about two-thirds of incremental aggregate financing in recent years in China. City leaders facing pressure to boost the local economy often resort to banks to finance local firms and infrastructure projects. Despite the pressure from city leaders, banks and firms can make their own decisions on how much credit and investment to expand. If uncertainty is high concerning the policy preference of the politician, banks and firms are more cautious about the expansion of credit and investment.

Empirical results show an inverted-U relationship between predicted remaining term length and bank loan increments, firm debt credit from banks, as well as firm investment and output. These findings support the hypothesis that banks and firms respond to political uncertainty when term length is uncertain. In city leaders' early years in the position, political uncertainty declines as their policy map becomes apparent as well as political-economic networks expand, the politically motivated financing and investment grow; when the city leader is expected to leave, economic agents refrain from new financing and investment owing to the sharply increasing political uncertainty. As a result, an inverted U-shaped relationship between politically motivated financing and investment and city leaders' time in office emerges. Group-wise analyses show that both major state-owned banks and local-government-controlled city commercial banks contribute to this relationship, whereas more market-oriented joint-stock commercial banks do not. We also find that the inverted-U relationship occurs only when the top city leader is transferred from outside the city, as the policy map is better predictable if the new leader has worked in the local authority. We also consider the potential adverse consequences of the politically motivated loan and investment expansion, such as a loss of corporate efficiency and a disruption in market order.

This paper contributes to the following two strands of literature. First, we add to the literature on political uncertainty and economic agents' behavior. Political uncertainty caused by actual political turnover has received sufficient attention in the literature, including both scheduled turnovers, such as elections (Julio and Yook, 2012; Kelly et al., 2016; Jens, 2017), and unscheduled turnovers, such as coups, sudden deaths, and unsynchronized political turnovers in the Chinese context (Abadie and Gardeazabal, 2003; Faccio and Parsley, 2009; An et al., 2016; Acemoglu et al., 2018; Cao et al., 2019; Fu and Chen, 2024). Noteworthily, political uncertainty also drives economic agents' behavior even when actual turnover *has not* occurred, which has not attracted sufficient attention in the literature. This paper explores political uncertainty caused by term length uncertainty. China features varying de facto term length and unsynchronized timing of turnover of city leaders, providing an ideal institutional environment to examine how economic agents react to political uncertainty without an actual turnover. In this sense, this paper extends the literature on political uncertainty to a broader scope.

Second, this paper adds to the research on political business cycles. Beginning with Nordhaus (1975) and continuing with numerous studies, this strand of literature contends that politicians motivate economic agents to increase their chances of (re-)election or promotion (Beck, 1987; Chang, 2008; Alpanda and Honig, 2009; Julio and Yook, 2012; García and Hayo, 2021). In the context of being rewarded for higher local economic growth, Chinese city leaders have a strong incentive to encourage banks to grant more loans to fuel economic growth, but their capacity to do so is constrained by political uncertainty perceived by banks and firms, resulting in a political business cycle that matches the change in political uncertainty over the term of city leaders. We extend this strand of literature

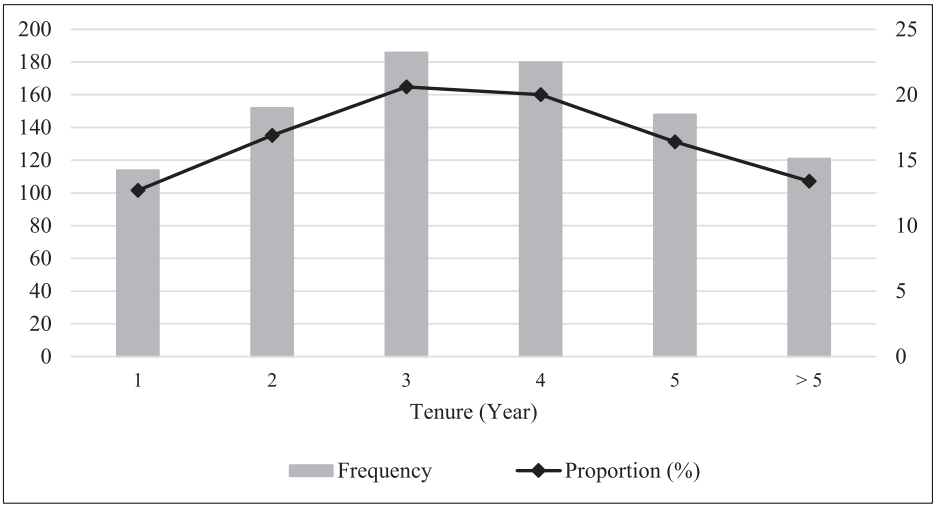

Fig. 1. The distribution of bureaucrats' tenure.

in three aspects. First, we deal with the measure of the political business cycle when term length is uncertain with machine-learning methods. Second, we include loan credit from commercial banks as a source of political business cycles. Last, we unify theories and empirics of political uncertainty and political business cycles by providing consistent evidence at both macro and micro levels.

The remainder of this paper is organized as follows: Section 2 outlines the background. Section 3 gives a theoretical mechanism to guide the interpretation of our results. Section 4 presents the data and method in detail. This is followed by an analysis of the empirical results in Section 5 and further discussion in Section 6. Section 7 shows the robustness tests. Finally, Section 8 concludes this study and provides directions for future research.

2. Institution background

2.1. Uncertain term length in China's local authorities

Unlike in many countries where government leaders have fixed term length, local leaders in China face uncertain de facto term length, although the *de jure* term length is five years. As a result, unsynchronized turnovers occur at different times and in various localities. Fig. 1 plots the distribution of actual term length of prefecture-level city leaders of more than 900 top city positions during 2007–2015. We find that the average length of time a top city leader served in a position is 3.6 years.

The uncertain term length of city leaders poses a challenge to capturing local political uncertainty. Although economic agents are unable to precisely know when the incumbent leader is leaving, they could share some perceptions based on historical records as well as personal characteristics of the leader, such as age, education background and career history. When economic agents believe that the incumbent is about to leave, their perception of political uncertainty rises, and they adjust their behavior accordingly, even if actual turnover does not happen. Existing literature on political uncertainty as well as political business cycles at China's local level, is mainly based on the cycle of the central authority (which is at a fixed frequency) or actual turnover of local leaders (Nie et al., 2013; Xi et al., 2018; Vortherms, 2019). Both methods fail to capture the essence of political uncertainty perceived by economic agents. In this paper, we implement a machine-learning method to predict the term length of city leaders by learning about others with similar backgrounds (as discussed in greater detail in Section 4.1) and explore how economic agents respond to their perception of political uncertainty when the actual term length is uncertain.

2.2. Bank-dominated financial system in China

China's financial system is dominated by indirect finance, especially bank loans. As shown in Fig. 2, bank loans were almost the only source of incremental aggregate financing in China in 2002. During later years, the stock market and bond market developed rapidly, but bank loans still accounted for about two-thirds of incremental aggregate financing.

Banks in China are classified into nationwide state-owned banks (a.k.a. the Big Five, for there are only five such banks before 2019), nationwide joint-stock commercial banks (the Joint-Stock), city commercial banks (the CCBs), and others. In this paper, we focus on the first three major types. According to statistics from the *China Banking Regulatory Commission* (CBRC), these three types of banks accounted for three-fourths of Chinese commercial banks' total assets during 2007–2017, while other banking financial institutions, such as rural commercial banks and foreign banks, held the remaining assets. As Fig. 3 shows, the Big Five are the major players in

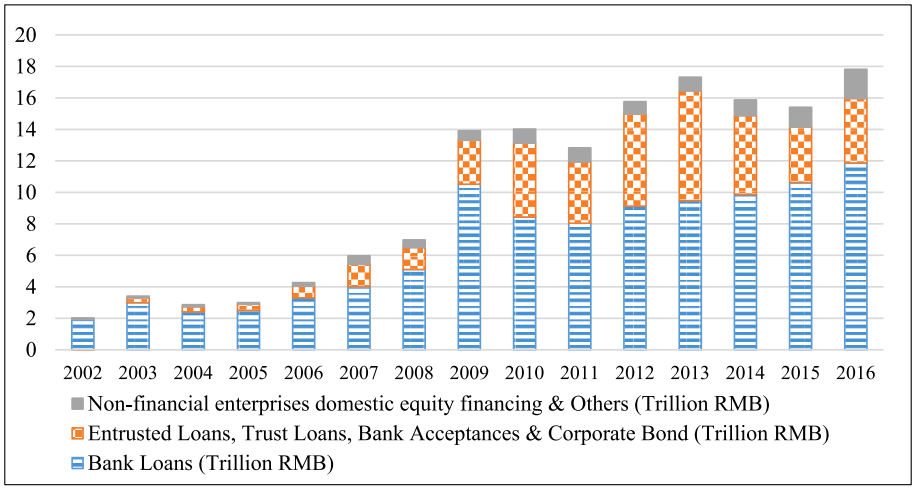

Fig. 2. Decomposition of China's aggregate financing (yearly flows).
Notes: Aggregate financing refers to the funds obtained by the real economy (domestic nonfinancial enterprises and households) from the financial system. We use the yearly incremental data of aggregate finance to produce this graph.
Source: Total Social Financing Data Set of the People's Bank of China.

China's banking system, holding 46.7% of total assets during 2007–2017 on average. The Joint-Stock and CCBs held 19.2% and 11.4% of the share, respectively.

Local governments wield varying degrees of power over different types of banks. Since CCBs are heavily controlled by local governments, we expect local governments to hold a powerful influence on CCBs' loan decisions. Table B1 in Appendix B lists the top 10 shareholders of selected large CCBs, indicating that local *Bureaus of Finance*, as well as local SOEs controlled by the local *State-Owned Assets Supervision and Administration Commission* (SASAC), are the major shareholders of the CCBs. Consequently, supporting political targets of local leaders becomes one of CCBs' top missions. Besides, local governments usually appoint the top executives of the CCBs, which further enhances the control power.

The Big Five are directly controlled by the central government. As Table B2 in Appendix B shows, the central government holds on average more than 50% of shares in these five banks. The chairs and presidents of the Big Five are appointed by the *Central Organization Department of Communist Party of China* and the *State Council*, rather than local governments. Although city leaders have limited power to intervene in the Big Five's headquarters' decisions, they have a strong incentive to lobby local branches of the Big Five that usually hold a much larger amount of financial resources than local CCBs. Moreover, local governments hold certain resources in exchange for loan support, including the deposit of budgetary funds and some off-balance-sheet funds. Therefore, we expect that the local government can influence the loan decisions of the Big Five's local branches to a certain extent, though less than the CCBs. Since the Big Five hold the greatest share of assets and loans, the role they play in boosting the local economy could still be substantial despite relatively weaker interference from the local leader.

Compared with the above two types, the Joint-Stock features a more diversified ownership structure and a smaller asset size compared with the Big Five (Zhu and Yang, 2016). As shown in Table B3 in Appendix B, the Joint-Stock are owned jointly by SOEs, the government, private firms, foreign investors, as well as retail investors who buy their stocks. Meanwhile, top executives of the Joint-Stock are elected by a board of directors rather than directly appointed by government departments. Therefore, we expect that the Joint-Stock are less subject to influences by local governments than the Big Five and CCBs.

3. Theoretical considerations

3.1. Power-base building and political uncertainty

In China's context, city leaders are appointed by the *Organization Department* at a higher level. New appointees may come from within or outside the jurisdiction. City leaders who have transferred from other jurisdictions face no power base when they start the job. Power-base building starts only after they take office and take a period. Contrarily, city leaders promoted within the jurisdiction require little power-base building since they have usually worked in the current jurisdiction as deputy leaders before taking office.

Policy capacity is positively related to the accumulation of power. Every policy initiation from the city leader needs collaboration from the bureaucracy and entrepreneurs deeply rooted in the jurisdiction. The city leaders aim to develop these local political and economic networks since the beginning of the term, particularly for city leaders who have transferred from outside the jurisdiction.

Furthermore, when new city leaders take office, their policy map is unclear to economic and other political agents, influencing their willingness to collaborate, so other agents will wait until the map is clear. Especially for the leaders transferred from another city, whose policy map is more difficult to foresee than if the new leader has worked in the local authority. Thus, the process of power-base building affects other agents' perceptions of political uncertainty.

3.2. Fading accountability over time and political uncertainty

Against the backdrop of China's pro-growth cadre evaluation, city leaders' political careers may be advanced if the jurisdiction they serve experiences a good record of economic growth, which works as a signal of capability. This target cannot be achieved without collaboration with the firms. City leaders can exert influence on local firms through various ways, including policies, regulations, and soft channels. Local firms may seek to establish political connections with bureaucrats by making politically motivated investments in exchange for support and benefit (e.g., government procurement contracts). Politically motivated investment is more likely to be made in areas without sound returns and may harm corporate efficiency. Therefore, firms are less willing to collaborate with the city leader if the established political connection is expected to be disrupted and the accountability from the city leader is going to be lost. Firms may act opportunistically ahead of anticipated political turnovers to maximize benefits from their current political connections (Liu et al., 2018).

To finance investment for economic growth, city leaders need help from banks on loan issuance to local firms that implement the projects. In exchange, they provide the banks with future benefits (e.g., contracts of fiscal deposits) based on total loan size. Assume that city leaders are concerned about reputation, so the commitment is credible when their term last. On the other hand, unlike policy banks, such as the *China Development Bank* (CDB) that Ru (2018) studies, Chinese commercial banks are subject to supervision from the CBRC and other departments regarding profitability, nonperforming loans, capital adequacy ratios, and other norms. Listed commercial banks are also required to publish financial statements quarterly. These regulatory pressures limit the willingness of local commercial banks to provide loan support for local governments if the lending carries high default risks. The banks can lower the chance of default by holding the city leader accountable. However, city leaders may be less responsible for their decisions when they are expected to leave soon. Moreover, the successor is often reluctant to take responsibility for the predecessor's commitments, which causes the loans issued for the sake of the previous city leader to lose accountability. As a result, commercial banks will reduce politically motivated loans, especially long-term loans, when the expected turnover of city leaders is close.

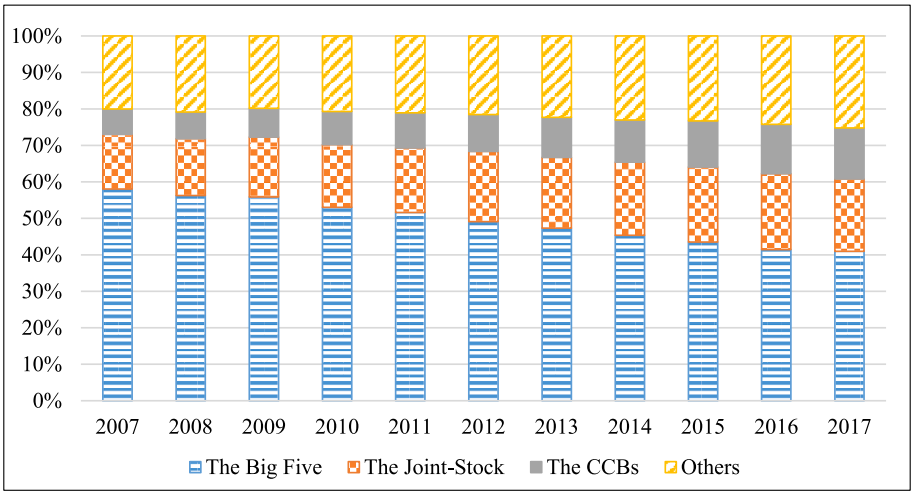

Fig. 3. Share of various banks in total assets of China's commercial banking system.
Notes: Quarterly data are published on the official website of the China Banking Regulatory Commission. We use the data at the end of the fourth quarter between 2007 and 2017 to produce this graph. "Others" include rural commercial banks, rural cooperative banks, rural credit unions, new rural financial institutions, private banks, foreign banks, nonbank financial institutions, asset management companies, and the Postal Savings Bank of China.
Source: China Banking Regulatory Commission.

In sum, as political uncertainty declines and political-economic networks expand, the capability of city leaders to intervene in the economy grows early in the term, while a downward trajectory appears when the city leader is expected to leave, owing to the sharply increasing risk of losing accountability. As a result, an inverted U-shaped relationship emerges between city leaders' ability to intervene in the economy and their time in office. Furthermore, the inverted U-shaped relationship may be more pronounced in the group of externally transferred leaders because their power-base-building process is more visible during their early years in the position.

4. Data and method

We employ several datasets to test our hypotheses described in the last section. First, the city leader-related database combines the *CCER Official Dataset* (COD) with other manually collected information from government websites. Second, the data of city-level aggregated outstanding loan balance and deposit balance are from the CBRC. Third, the statistics of Chinese cities come from the *China City Statistical Yearbook*. Forth, the statistics of industrial firms are from the *Annual Survey of Industrial Firms* (ASIF), which is maintained by China's *National Bureau of Statistics*.

4.1. Political uncertainty: a new measurement with machine learning

In theory, the intensity of city leaders' economic intervention rises and then falls during their term. However, as described in Section 2.1, China's local political turnovers are characterized by a high degree of uncertainty. The uncertain term length of city leaders poses a challenge to capturing the continuous-time changes in economic agents' behaviors during the whole term.

Although an exact political turnover cannot be forecasted, political leaders and economic agents have some prior concerns concerning how long the city leader will serve in the position by observing other city leaders with similar backgrounds. For example, city leaders over the age of 55 typically have a shorter term length, as their path to upward mobility is about to close due to the mandatory retirement age of city leaders being 60 and they may have a greater incentive to stimulate economic growth to get promoted so as to extend their political career beyond 60. In addition, in practice, officials who are sent to undertake postgraduate studies on the job, especially at party schools, may be promoted sooner, implying that educational background also affects the term length.

With this knowledge, we implement a machine-learning method to predict the term length without the endogeneity issue (details in Appendix A), and investigate how political uncertainty caused by uncertain term length affects the behaviors of banks and firms. The predicted term length is determined by city leaders' characteristics, such as educational background and work experience, and is unaffected by the local economic situation. We assume that city leaders will roughly estimate their term length by observing those with similar backgrounds as themselves when they take office, and then control the timing of their intervention in economic development. Simultaneously, banks and firms can also pick up on this signal and adjust their behavior based on the city leaders' remaining term

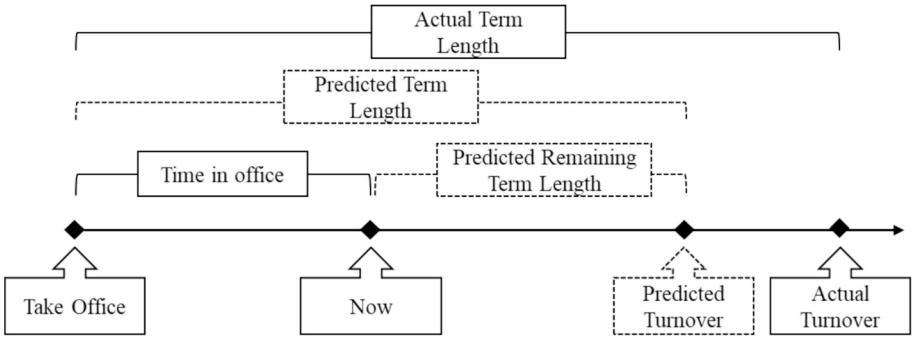

Fig. 4. Definitions related to the city leaders' political career.

length. To minimize confusion, we draw Fig. 4 to show the definitions of several variables stated in this paper that are relevant to the political career of a city leader.

For data of city leaders, we utilize *CCER Official Dataset* (COD)[2] and manually complement some additional information from official media, such as Xinhua Net and other government websites. Our working dataset contains background information of all publicly available top leaders of prefecture-level cities in China who took office since 1990, including seven basic information variables, five education-related variables, and four career-related variables (details in Table A1).[3] All of these variables have been proven to be strongly associated with the political careers of Chinese officials (Bo, 1996; Yao and Zhang, 2015; Wang et al., 2020). The dataset is divided into two parts: a set for training and a set for prediction. The set for prediction consists of prefecture-level city leaders from 2007 to 2011 who are involved in our empirical regression; the set for training consists of the remaining city leaders. The set for prediction has 522 city leaders, whereas the set for training includes 689 leaders.

We then use the *random forest* model to predict the term length of local city leaders upon arrival. The *random forest* is an ensemble machine-learning model introduced by Breiman (2001). According to Dietterich (2000), it is one of the most successful ensemble models in machine learning. The main idea of the *random forest* model is to combine multiple regression trees to improve the accuracy and robustness of the outcomes.

The random forest model begins with creating a single leaf and developing regression trees. A regression tree is a form of decision tree that is built through an iterative process that divides the data into nodes or branches into smaller groups. Regression trees are trained individually using bootstrapped data, and their output is averaged to produce predictions. The predictor that splits the tree is the one that most clearly separates the observations into two distinct groups while also minimizing the residual error, which is measured with mean squared error (Friedman, 2001). A random forest is made up of a number of decision trees, each of which has many decision nodes. In our application to the predicted term length of Chinese city leaders, those decision nodes are their background information, such as age and gender, etc.

We then subtract the time in office from the predicted term length to obtain the predicted remaining term length as our core explanatory variable for measuring the political uncertainty. The shorter the predicted remaining term length, the greater the political uncertainty caused by turnover. The time in office of a city leader is measured as years from the first year in office. To be consistent with the literature (Li and Zhou, 2005), a city leader who takes the position during the second half of a year is regarded as taking the position from the next year on.

To be specific, we focus on city party secretaries, who are the de facto heads of the city administration in various aspects. Among 1254 city-year observations for 2007–2011, city leaders' average predicted term length is 3.8 years, which is consistent with the average actual term length recorded in the literature (Kou and Tsai, 2014; Yao and Zhang, 2015; Landry et al., 2018; Xi et al., 2018; Li et al., 2019).

4.2. Datasets relating to banks, corporations, and cities

The data of city-level aggregated outstanding loan balance and deposit balance are from the CBRC, which reports information on bank loans and deposits of various types of banks at the county level during 2007–2011. We aggregate outstanding loan and deposit balances at the city level to meet our research needs. Banks' average outstanding loan balance in a city is 84.3 billion CNY, with 43.1 billion CNY from the Big Five, 11.7 billion CNY from the Joint-Stock, and 5.8 billion CNY from the CCBs.

The *China City Statistical Yearbook*, an annual statistical publication, reports comprehensive economic and social development indicators for Chinese cities. We select and control the indicators that may affect the demand for bank loans at the city level, including GDP, GDP growth rate, the proportion of the secondary and tertiary industries in GDP, fixed asset investment, and population. Among 278 cities in our samples, the average population is 4.1 million, and the average GDP is 117.2 billion CNY.

The ASIF database contains financial information on industrial firms with annual revenues of more than 5 million CNY (about 0.75

[2] This dataset is collected by Political Economy Research Group of National School of Development, Peking University.

[3] Considering the integrity of term length in the sample range, we delete the samples of top city leaders who were still in office by the end of 2017.

million USD) from 1998 to 2013.[4] This dataset is the most comprehensive Chinese firm-level panel database available, covering most Chinese industrial firms. We identify the city where each firm is located to match city leaders' information. We use the years 2006–2011 and remove the 2010 sample due to the problem of data quality.[5] The corporation liabilities with different maturities, fixed asset investment, industrial output, profitability, ROA, ROE, and probability of insolvency are variables of interest to us.

Table 1 reports the summary statistics of key variables in the four databases used in our research.

5. Empirical results and analysis

This section examines our theoretical considerations by presenting four sets of empirical results. We first present baseline empirical results on the relationship between political uncertainty and city-level aggregated bank loans, followed by bank heterogeneity. We then extend the empirical analysis to industrial firms and explore the relationship between their political career and firm-level liabilities, output, and performance.

5.1. Political uncertainty and Bank loans

We start with the regression model:

$$Del\_Ln(loans)_{i,t} = \alpha + \beta_1 PRT_{i,t} + \beta_2 PRT^2_{i,t} + \sum Control + \nu_i + g_t + e_{i,t}, \quad (1)$$

where the dependent variable is the natural logarithm of total outstanding loan balance and loan balance from three types of banks in city i year t minus those in city i year t-1. $PRT_{i,t}$ is defined as the city leader's predicted remaining term length in city i year t, which is obtained by subtracting the length of time in office from the predicted term length.[6] We include both the city leader's predicted remaining term length and its squared term on the right-hand side of the baseline regression as the most interested explanatory variables to capture the nonlinear relationship. We also include the one-period lagged term of the following city-level variables: the natural logarithm of GDP, GDP growth rate, the proportion of the secondary and tertiary industry in GDP, the natural logarithm of city investment in fixed assets, and the natural logarithm of population. We further control year and city-fixed effects to capture year-specific differences and city heterogeneities. Standard errors are clustered at the city level.

Table 2 reports the estimated results of Eqs. (1). As Column (1) shows, the total outstanding loan balance has an inverted U-shaped relationship as the city leader's predicted remaining term length decreases, with the turning point of the parabola at 1.40 ($= 1/2 \times 0.474 / 0.169$). The findings support our hypothesis that in city leaders' early years in the position, banks significantly increase the size of loans to meet their requests to develop the economy, while a downward trajectory appears when city leaders are expected to leave, owing to the sharply increasing risk of losing accountability.

Columns (2)–(4) present the heterogeneous effects among different types of banks. We find that the outstanding loan balance in the Big Five and CCBs show an inverted U-shaped relationship with a city leader's predicted remaining term length, but the Joint-Stock does not show a similar pattern. For the Big-Five, the turning point of the parabola is 1.42 ($= 1/2 \times 0.425 / 0.150$); for the CCBs, the turning point is 1.23 ($= 1/2 \times 0.278 / 0.113$). The CCBs reach the turning point a little later than the Big Five, implying that CCBs, under local governments' strongest control, provide more sustained financial support for city leaders during their term.

As described in Section 2, among the three types of banks, the Joint-Stock has the lowest proportion of government ownership, and local governments have the least control over the change of their top leaders. Besides, the outstanding loan balance of the Joint-Stock is only about one-fifth of the Big Five. These facts can potentially explain why the Joint-Stock are least affected by city leaders' political careers.

Another intriguing phenomenon is city leaders' appointment origins cause differences in political power accumulation, affecting their interventions in regional economic agents. As stated in Section 2, city leaders may be appointed from within or outside the jurisdiction. When city leaders are transferred from another jurisdiction, they begin with no power base. Building a power base takes time after they take office. On the other hand, city leaders who are promoted within the jurisdiction usually require little power-base building. Therefore, as shown in Table 3, the inverted U-shaped relationship between city leaders' predicted remaining time and city-level aggregated bank loans appears only in the sample of city leaders transferred from outside the jurisdiction.

5.2. Political uncertainty and corporate behavior

5.2.1. Corporate liability

In the previous section, we demonstrated the interaction between city leaders and banks, particularly the Big Five and CCBs. In addition to bank heterogeneity, we would like to investigate heterogeneous effects on loan maturities. As detailed in Section 3, we expect that banks issue fewer long-term loans during a city leader's later period in the position because of the higher risks of bank loans with longer maturities.

[4] The threshold has been raised to 20 million CNY (about 3.1 million USD) since 2011.

[5] We check total assets, total liabilities, and total equity according to the accounting equation, and we find only about 0.3% of samples can match the accounting equation in 2010.

[6] The predicted remaining term length is equal to 0 if it is less than 0.

Table 1
Summary statistics.

Panel A: City leader-related variables				
Variable name	N	Mean	Median	Std. Dev.
Predicted term length (year)	1254	3.8	3.8	0.2
Time in office (year)	1254	2.6	2.0	1.3
Predicted remaining term length (year)	1254	1.2	1.4	1.1

Panel B: Banking-related variables				
Variable name	N	Mean	Median	Std. Dev.
Total loan balance (billion CNY)	1254	84.5	35.9	134.5
The Big Five's loan balance (billion CNY)	1254	43.2	18.3	64.4
The Joint-Stock's loan balance (billion CNY)	1254	11.8	0.0	33.9
The CCBs' loan balance (billion CNY)	1254	5.9	1.6	10.2
Total loan balance / GDP (%)	1254	63.0	55.6	39.3
Growth rate of total loan balance (%)	1254	12.5	17.8	33.3

Panel C: City-related variables				
Variable name	N	Mean	Median	Std. Dev.
Population (thousand)	1254	4146.2	3612.5	2373.6
Secondary industry / GDP (%)	1254	50.2	50.6	10.6
Tertiary industry / GDP (%)	1254	35.3	34.6	7.9
GDP (billion RMB)	1254	117.2	73.0	131.9
Growth rate of GDP (%)	1254	13.9	13.9	2.8
Fixed-asset investment (billion CNY)	1254	67.2	45.2	67.3

Panel D: Firm-related variables				
Variable name	N	Mean	Median	Std. Dev.
Total assets (million CNY)	463,170	107.9	27.5	274.0
Total liabilities (million CNY)	463,170	60.5	13.3	161.9
Long-term liabilities (million CNY)	463,170	6.9	0.0	32.0
Short-term liabilities (million CNY)	463,170	40.9	7.8	116.5
Fixed asset (million CNY)	463,170	36.3	7.9	99.6
Industrial output (million CNY)	463,170	143.8	50.0	295.9
Tangible (%)	463,170	52.9	53.1	22.7
Leverage (%)	463,170	54.6	55.7	27.9
Return on assets (%)	463,170	13.0	5.2	21.6
SD_Return on assets (%)	463,170	5.7	2.8	7.7
Return on equity (%)	463,170	26.7	11.1	58.0
Profit rate (%)	463,170	4.4	3.3	7.9
Insolvency	463,170	0.2	0.0	0.4

Because the CBRC database does not classify loans with different maturities, we match the city leader's information with the ASIF database that contains financial information on Chinese industrial firms by the cities where the firms are located. We then examine the relationship between the city leader's predicted remaining term length and corporate liabilities with different maturities using the following regression model:

$$Del\_Ln(liabilities)_{i,j,t} = \alpha + \lambda_1 PRT_{i,t} + \lambda_2 PRT^2{}_{i,t} + \sum Control + v_i + g_t + u_j + e_{i,j,t}, \quad (2)$$

where the dependent variables are the natural logarithm of total liabilities, short-term liabilities and long-term liabilities in city *i*, firm *j*, and year *t* minus those in year *t-1*. $PRT_{i,t}$ and its squared term are the explanatory variables. We also control the firm-level variables in the empirical model, including return on assets, an indicator of how efficient a firm is at using its assets to generate earnings; the standard deviation of return on assets during the past three years, an indicator to capture operational risks of the firm; the natural logarithm of total assets, an indicator of the firm size; tangible asset ratio, an indicator that measures the collateralizable assets for financing; and profitability, an indicator of internal financing opportunities. All the control variables are lagged for one period. We further control year, city, and firm fixed effects. Standard errors are clustered at the firm level.

Table 4 reports the results of Eq. (2). Column (1) shows an inverted U-shaped relationship between firm-level total liabilities and the city leader's predicted remaining term length, and the turning point of the parabola is 1.41 (= 1/2 × 0.048 / 0.017). Column (2) shows that the turning point for long-term liabilities is 2.06 (= 1/2 × 0.161/ 0.039), greater than the turning point of the total liabilities. Contrarily, Column (3) shows no significant correlation between city leaders' political careers and short-term liabilities with maturity shorter than one year. These findings show that in a city leader's early years in the position, banks grant more loans,

Table 2
The effect of city leaders' political career on bank loans.

Variables	Del_Ln(Total loan balance)$_{i,t}$	Del_Ln(the Big Five's loan balance)$_{i,t}$	Del_Ln(the Joint-Stock's loan balance)$_{i,t}$	Del_Ln(the CCBs' loan balance)$_{i,t}$
	(1)	(2)	(3)	(4)
$PRT_{i,t}$	0.474**	0.425**	0.009	0.278**
	(0.195)	(0.171)	(0.110)	(0.141)
PRT Squared$_{i,t}$	−0.169**	−0.150**	−0.013	−0.113**
	(0.068)	(0.060)	(0.038)	(0.049)
Ln($GDP_{i,t-1}$)	3.376***	3.020***	0.002	1.753**
	(1.190)	(1.064)	(0.781)	(0.698)
GDP Growth Rate $_{i,t-1}$	−0.037	−0.041	−0.007	−0.014
	(0.044)	(0.039)	(0.018)	(0.025)
$Sec\_Ind_{i,t-1}/GDP_{i,t-1}$	−0.118**	−0.093**	0.016	−0.032
	(0.053)	(0.046)	(0.025)	(0.028)
$Ter\_Ind_{i,t-1}/GDP_{i,t-1}$	−0.092*	−0.072	0.025	−0.002
	(0.055)	(0.047)	(0.026)	(0.034)
Ln(Population)$_{i,t-1}$	−6.085	−4.812	−2.449	−3.442
	(8.707)	(7.774)	(5.974)	(5.788)
Ln(Investment)$_{i,t-1}$	0.019	0.107	0.090	0.089
	(0.459)	(0.399)	(0.229)	(0.242)
Year F.E.	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y
R-squared	0.097	0.099	0.166	0.115
Observations	1254	1254	1254	1254

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at city level.

Table 3
The effect of city leaders' political career on bank loans: city leaders of different origins.

VARIABLES	Del_Ln(Total loan balance)$_{i,t}$		Del_Ln(the Big Five's loan balance)$_{i,t}$		Del_Ln(the Joint-Stock's loan balance)$_{i,t}$		Del_Ln(the CCBs' loan balance)$_{i,t}$	
	Local Promoted	Transferred	Local Promoted	Transferred	Local Promoted	Transferred	Local Promoted	Transferred
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$PRT_{i,t}$	0.130	0.966***	0.127	0.846***	0.170	−0.159	0.205	0.462*
	(0.317)	(0.356)	(0.273)	(0.314)	(0.176)	(0.203)	(0.225)	(0.251)
PRT Squared$_{i,t}$	−0.043	−0.316**	−0.042	−0.274**	−0.037	0.031	−0.090	−0.158*
	(0.098)	(0.128)	(0.084)	(0.112)	(0.057)	(0.069)	(0.074)	(0.087)
Ln($GDP_{i,t-1}$)	4.082	1.930	3.664	1.679	1.302	−3.286**	2.323*	0.913
	(2.496)	(1.886)	(2.232)	(1.688)	(1.141)	(1.512)	(1.387)	(1.414)
GDP Growth Rate $_{i,t-1}$	0.011	−0.058	−0.002	−0.055	0.010	−0.015	0.016	−0.024
	(0.072)	(0.079)	(0.064)	(0.068)	(0.027)	(0.027)	(0.040)	(0.040)
$Sec\_Ind_{i,t-1}/GDP_{i,t-1}$	−0.201**	−0.081	−0.162*	−0.058	−0.017	0.047	−0.084	−0.014
	(0.098)	(0.100)	(0.086)	(0.084)	(0.043)	(0.050)	(0.054)	(0.048)
$Ter\_Ind_{i,t-1}/GDP_{i,t-1}$	−0.063	−0.095	−0.042	−0.075	0.011	0.026	−0.026	0.020
	(0.096)	(0.092)	(0.083)	(0.078)	(0.044)	(0.049)	(0.062)	(0.052)
Ln(Population)$_{i,t-1}$	5.079	−4.452	5.019	−3.223	5.877	1.351	7.244	−6.292
	(12.842)	(7.364)	(11.266)	(6.670)	(8.063)	(4.901)	(7.705)	(4.548)
Ln(Investment)$_{i,t-1}$	0.096	−0.066	0.145	0.053	0.234	0.092	−0.117	0.098
	(0.808)	(0.897)	(0.710)	(0.775)	(0.375)	(0.392)	(0.527)	(0.368)
Year F.E.	Y	Y	Y	Y	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.123	0.298	0.129	0.299	0.266	0.250	0.155	0.270
Observations	641	613	641	613	641	613	641	613

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at city level.

particularly long-term loans, to industrial firms; however, as the predicted remaining term length decreases, the risk of losing accountability increases, causing banks to reduce the size of long-term loans. Furthermore, long-term liabilities reach a turning point a little earlier than total liabilities, demonstrating the sensitivity of long-term liabilities to risk.

5.2.2. Corporate investment and output

Until now, our findings demonstrate the inverted U-shaped relationships between city leaders' predicted remaining term length and bank loans as well as corporate liabilities. Loans must be transformed into economic output for ambitious politicians to fulfill their political goals. Therefore, we further explore the relationship between a city leader's political career and corporate fixed-asset investment and output, using the following regression model:

Table 4
The effect of city leaders' political career on corporate liabilities.

Variables	Del_Ln(Total liabilities)$_{i,j,t}$	Del_Ln(Long-Term liabilities)$_{i,j,t}$	Del_Ln(Short-Term liabilities)$_{i,j,t}$
	(1)	(2)	(3)
$PRT_{i,t}$	0.048***	0.160***	0.014
	(0.011)	(0.026)	(0.014)
PRT Squared$_{i,t}$	−0.017***	−0.039***	−0.006
	(0.004)	(0.008)	(0.005)
Ln(Total assets$_{i,t-1}$)	−0.805***	−0.533***	−0.807***
	(0.017)	(0.033)	(0.021)
$ROA_{i,t-1}$	0.331***	−0.018	0.302***
	(0.062)	(0.117)	(0.082)
$SD\_ROA_{i,t-1}$	−0.001	−0.264	0.123
	(0.113)	(0.214)	(0.147)
Profitability$_{i,j,t-1}$	0.342***	0.195	0.348***
	(0.100)	(0.239)	(0.132)
Tangible$_{i,t-1}$	0.296***	−0.567***	0.374***
	(0.036)	(0.074)	(0.047)
Year F.E.	Y	Y	Y
Industry F.E.	Y	Y	Y
Firm F.E.	Y	Y	Y
R-squared	0.389	0.357	0.374
Observations	463,170	463,170	463,170

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at firm level.

$$Del\_Ln(outcome)_{i,j,t} = \alpha + \lambda_1 PRT_{i,t} + \lambda_2 PRT^2{}_{i,t} + \sum Control + v_i + g_t + u_j + e_{i,j,t}, \quad (3)$$

where the dependent variables are the natural logarithm of corporate fixed-asset and industry output in city i, firm j, and year t minus those in year t-1. $PRT_{i,t}$ and its squared term are the explanatory variables. We also control the one-period lagged term of firm-level variables, including return on assets, the standard deviation of return on assets during the past three years; profitability, the natural logarithm of total assets; tangible asset ratio; and leverage. We control year, city, and firm fixed effects. Standard errors are clustered at the firm level.

Table 5 reports the coefficients of Eq. (3). The result in Column (1) reveals that corporate fixed-asset investment and output both have an inverted U-shaped relationship with the city leader's predicted remaining term length, and the turning point of the parabola is 1.31 (= 1/2 × 0.021 / 0.008) and 0.81(= 1/2 × 0.013/ 0.008), respectively. The findings are consistent with the relationship between city leaders' predicted remaining term length and corporate liabilities. Interestingly, the turning points of liabilities (1.41), fixed-asset investment (1.31), and output (0.81) emerge one after the other, which corroborates our conjecture that, in city leaders' early years in office, with their mobilization, firms utilize their liabilities to expand investment and thus industrial output increased until the leader is very likely to leave.

5.2.3. Corporate performance

We have empirically demonstrated that motivated by political incentives, city leaders probably pressurize banks to lend to some firms to expand investment and production, hence promoting local economic growth. However, politically motivated investment is more likely to be made in areas without sound returns, which could harm corporate efficiency. In this section, we explore the relationship between city leaders' political careers and corporate performance using the following regression model:

$$Performance_{i,j,t} = \alpha + \lambda_1 PRT_{i,t} + \lambda_2 PRT^2{}_{i,t} + \sum Control + v_i + g_t + u_j + e_{i,j,t}, \quad (4)$$

where the dependent variables are profitability, return on assets, return on equity, and exit in city i, firm j, and year t.[7] $PRT_{i,t,}$ and its squared term are the explanatory variables. We also control the one-period lagged term of firm-level variables, including the standard deviation of return on assets during the past three years, the natural logarithm of total assets, tangible asset ratio, and leverage. We further control year, city, and firm fixed effects. Standard errors are clustered at the firm level.

Table 6 reports the coefficients of Eq. (4). The results in Columns (1)–(3) reveal that the profitability, return on assets, and return on equity have a U-shaped relationship with the city leader's predicted remaining term length, and the turning point of the parabola is 1.55 (= 1/2 × 0.229 / 0.074), 2.00 (= 1/2 × 1.112/ 0.278), and 1.81 (= 1/2 × 3.414/ 0.942), respectively. The findings are opposed to those of corporate liabilities and investment. It could be attributed to the fact that politically motivated expansion of investment and production does not yield a sound economic return, resulting in a loss of corporate efficiency. Furthermore, it is worth noting that the relationship between the insolvency probability and city leaders' predicted remaining term length is surprisingly consistent with

[7] The dependent variable $exit_{i,j,t}$ is a dummy variable that equals one if the firm j was not found in our database in city i year t, and zero otherwise. A firm's exit could be due to insolvency, shutdown, or a lack of annual revenue that meets the threshold for inclusion in the database (5 million CNY prior to 2010, and 20 million CNY since 2011).

Table 5
The effect of city leaders' political career on corporate output.

Variables	$Del\_Ln(Fixed\text{-}asset)_{i,j,t}$	$Del\_Ln(Industry\ output)_{i,j,t}$
	(1)	(2)
$PRT_{i,t}$	0.021***	0.013***
	(0.005)	(0.004)
$PRT\ Squared_{i,t}$	−0.008***	−0.008***
	(0.002)	(0.001)
$Ln(Total\ assets_{i,t-1})$	−0.637***	−0.230***
	(0.009)	(0.005)
$ROA_{i,t-1}$	0.444***	−0.666***
	(0.029)	(0.018)
$SD\_ROA_{i,t-1}$	−0.110**	0.049
	(0.053)	(0.032)
$Profitability_{i,j,t-1}$	−0.385***	0.336***
	(0.046)	(0.041)
$Tangible_{i,t-1}$	−1.880***	0.028***
	(0.019)	(0.010)
$Leverage_{i,t-1}$	0.172***	0.048***
	(0.017)	(0.011)
Year F.E.	Y	Y
City F.E.	Y	Y
Firm F.E.	Y	Y
R-squared	0.555	0.570
Observations	463,170	463,170

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at firm level.

Table 6
The effect of city leaders' political career on corporate performance.

Variables	$Profitability_{i,j,t}$	$ROA_{i,j,t}$	$ROE_{i,j,t}$	$Exit_{i,j,t}$
	(1)	(2)	(3)	(4)
$PRT_{i,t}$	−0.229***	−1.112***	−3.414***	−0.028***
	(0.043)	(0.103)	(0.368)	(0.002)
$PRT\ Squared_{i,t}$	0.074***	0.278***	0.942***	0.007***
	(0.014)	(0.033)	(0.120)	(0.001)
$Ln(Total\ assets_{i,t-1})$	−0.152***	0.146	−0.357	−0.054***
	(0.050)	(0.151)	(0.493)	(0.003)
$SD\_ROA_{i,t-1}$	−5.000***	−21.537***	−68.885***	−0.056***
	(0.424)	(1.531)	(4.691)	(0.018)
$Tangible_{i,t-1}$	−0.003	0.277	2.152*	−0.026***
	(0.112)	(0.331)	(1.116)	(0.006)
$Leverage_{i,t-1}$	0.947***	0.829**	−3.721***	0.023***
	(0.123)	(0.337)	(1.261)	(0.006)
Year F.E.	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y
Firm F.E.	Y	Y	Y	Y
R-squared	0.757	0.818	0.666	0.676
Observations	463,170	463,170	463,170	463,170

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at firm level.

corporate performance. As shown in Column (4), the exit probability has a U-shaped relationship with the city leader's predicted remaining term length, and the turning point of the parabola is 2.00 ($= 1/2 \times 0.028 / 0.007$). When corporate performance is at a low ebb, the probability of insolvency is also low, which is contrary to market discipline. It is implied that city leaders interfere with the normal market clearing behaviors in order to expand investment and stabilize employment.

5.3. *Firm-level heterogeneity*

Firm features may also drive the heterogeneity in the documented U-shaped pattern, particularly differences in risk tolerance among different types of firms. Therefore, we further conduct firm-level heterogeneity tests based on firm ownership and asset size. For ownership, we classify firms into private and state-owned; for asset size, we split firms into three groups of equal sample size.

Tables 7 and 8 report the results of firm ownership and asset size heterogeneity, respectively. Results in Table 7 show that the inverted U-shaped relationship with city leaders' predicted remaining term length appears in private firms only; results in Table 8 show that the relationship appears in small and medium firms only. These findings imply that the financing and investment decisions of private and small and medium firms are more sensitive to changes in political uncertainty due to their poorer risk tolerance, which is consistent with the findings of Xu et al. (2024).

Table 7
Firm ownership heterogeneity.The effect of city leaders' political career on corporate liabilities and investment.

VARIABLES	Del_Ln(Total liabilities)$_{i,j,t}$		Del_Ln(Fixed-asset)$_{i,j,t}$	
	Private	State-owned	Private	State-owned
	(1)	(2)	(3)	(4)
$PRT_{i,t}$	0.043***	0.026	0.027***	−0.000
	(0.014)	(0.029)	(0.007)	(0.016)
PRT Squared$_{i,t}$	−0.016***	−0.009	−0.011***	−0.002
	(0.005)	(0.010)	(0.002)	(0.005)
Ln(Total assets$_{i,t-1}$)	−0.805***	−0.730***	−0.688***	−0.503***
	(0.021)	(0.074)	(0.011)	(0.046)
$ROA_{i,t-1}$	0.249***	0.502	0.421***	0.237
	(0.076)	(0.339)	(0.035)	(0.150)
$SD\_ROA_{i,t-1}$	0.065	−0.149	−0.103	0.083
	(0.140)	(0.515)	(0.066)	(0.258)
$Profitability_{i,j,t-1}$	0.501***	−0.044	−0.479***	−0.099
	(0.150)	(0.250)	(0.072)	(0.116)
$Tangible_{i,t-1}$	0.260***	0.210*	−1.992***	−1.773***
	(0.045)	(0.123)	(0.024)	(0.082)
$Leverage_{i,t-1}$			0.165***	0.180**
			(0.022)	(0.072)
Year F.E.	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y
Firm F.E.	Y	Y	Y	Y
R-squared	0.428	0.486	0.587	0.604
Observations	312,417	30,051	312,417	30,051

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at firm level.

Table 8
Asset size heterogeneity.The effect of city leaders' political career on corporate liabilities and investment.

VARIABLES	Del_Ln(Total liabilities)$_{i,j,t}$			Del_Ln(Fixed-asset)$_{i,j,t}$		
	Small	Medium	Big	Small	Medium	Big
	(1)	(2)	(3)	(4)	(5)	(6)
$PRT_{i,t}$	0.065**	0.042*	0.021	0.019*	0.024**	0.008
	(0.028)	(0.023)	(0.015)	(0.011)	(0.010)	(0.007)
PRT Squared$_{i,t}$	−0.026***	−0.013*	−0.008	−0.007**	−0.008**	−0.004
	(0.009)	(0.008)	(0.005)	(0.004)	(0.003)	(0.002)
Ln(Total assets$_{i,t-1}$)	−0.869***	−0.917***	−0.759***	−0.708***	−0.691***	−0.568***
	(0.041)	(0.036)	(0.026)	(0.018)	(0.016)	(0.014)
$ROA_{i,t-1}$	0.220*	0.019	0.395***	0.298***	0.336***	0.370***
	(0.131)	(0.139)	(0.123)	(0.052)	(0.056)	(0.062)
$SD\_ROA_{i,t-1}$	−0.189	−0.085	0.157	−0.105	−0.254***	−0.195*
	(0.230)	(0.247)	(0.210)	(0.094)	(0.097)	(0.103)
$Profitability_{i,j,t-1}$	0.322	0.697***	0.367***	−0.581***	−0.435***	−0.133**
	(0.401)	(0.238)	(0.128)	(0.150)	(0.093)	(0.066)
$Tangible_{i,t-1}$	0.192**	0.316***	0.329***	−1.783***	−1.914***	−1.961***
	(0.081)	(0.075)	(0.059)	(0.039)	(0.036)	(0.033)
$Leverage_{i,t-1}$				0.230***	0.163***	0.132***
				(0.035)	(0.032)	(0.030)
Year F.E.	Y	Y	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y	Y	Y
Firm F.E.	Y	Y	Y	Y	Y	Y
R-squared	0.522	0.554	0.501	0.681	0.733	0.660
Observations	154,391	154,389	154,390	154,391	154,389	154,390

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at firm level.

6. Further discussion

Both expected term length and actual term length may have influential impacts on agents' expectations of political uncertainty. Therefore, we further discuss the effect of the expected and actual political cycle on bank loans. In other words, whether the actual turnover matched expectations.

To discuss how actual term length affects the inverted-U-shaped relationship between bank loan and expected turnover, we split the sample into two groups: officials whose actual term length is shorter than the expected term length, and officials whose actual term length is longer than the expected term length. If our theory is correct, we should observe an inverted-U relationship in the first group, as the unexpected termination before expected term length does not affect such a relationship. For the second group, we expected a

much weaker relationship, as the unexpected extension of term length may mess up the relationship. Table 9 shows the results for the two subsamples. We find that the inverted-U relationship is strong in the first group but weak in the second group.

7. Robustness tests

7.1. Statutory term length

According to Chinese central government regulations, the statutory term length for city leaders is five years. Following Chen et al. (2020), we consider the timing of expected turnover for a city leader to be the fifth year in office for the robustness test, and then the predicted remaining term length is five minus the length of time in office. The timing of expected turnovers is pre-determined; thus, general economic conditions do not affect expected turnovers.

We replace the explanatory variables of Eq. (1) with $5\text{-}TIO_{i,t}$ and its squared term. *TIO* represents the time in office of city leaders, which is defined as the years from the first year in which they take the position. The other variables stay the same as in Eq. (1). We also control year and city-fixed effects. Standard errors are clustered at the city level.

Table 10 reports the estimated results. Column (1) shows that the total outstanding loan balance has an inverted U-shaped relationship as the city leader's predicted remaining term length decreases. Columns (2)–(4) present the heterogeneous effects among different types of banks. The outstanding loan balance in the Big Five and CCBs show an inverted U-shaped relationship with a city leader's predicted remaining term length, but such a pattern does not appear in the Joint-Stock. The findings are consistent with baseline results shown in Table 2.

7.2. Actual term length

In the baseline regression of Section 5, we investigate how economic agents' priori expectations of the political cycle affect their behavior. As with previous research, it is also useful to consider the impact of actual political cycle on economic agents (An et al., 2016; Cao et al., 2019; Fu and Chen, 2024). Therefore, we investigate the cyclical impact of city leaders' actual time in office on bank loans. As shown in Table 11, when a new city leader starts the position, the city-level bank loans, especially from state-owned banks, expand until after the third year when the leader is very likely to leave, consistent with conclusions based on a priori expectations. However, findings based on the actual political cycles may be influenced by endogenous issues. As a comparison, empirical analysis based on a priori expectations has a clean identification, with the key identifying assumption being that the expected turnover of city leaders is exogenously determined.

7.3. Alternative measures of bank loan variables

To further check the robustness of our baseline empirical results reported in Column (1) of Table 2, we replace the explained

Table 9
The effect of city leaders' political career on bank loans: below and above expected term length.

VARIABLES	Below expectation: actual term length shorter than or equal to expected term length	Above expectation: actual term length longer than expected term length
	Del_Ln(Total loan balance)$_{i,t}$	
	(1)	(2)
$PRT_{i,t}$	0.772**	0.188
	(0.390)	(0.270)
PRT Squared$_{i,t}$	−0.292**	−0.050
	(0.117)	(0.096)
Ln(GDP$_{i,t-1}$)	2.941	4.706
	(1.846)	(2.961)
GDP Growth Rate $_{i,t-1}$	−0.013	−0.067
	(0.067)	(0.070)
Sec_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.262**	−0.115
	(0.111)	(0.089)
Ter_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.153	−0.127
	(0.113)	(0.081)
Ln(Population)$_{i,t-1}$	−12.330	−3.406
	(11.678)	(7.361)
Ln(Investment)$_{i,t-1}$	0.104	0.443
	(0.713)	(1.088)
Year F.E.	Y	Y
City F.E.	Y	Y
R-squared	0.208	0.217
Observations	661	593

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at city level.

Table 10
The effect of city leaders' political career on bank loans: the statutory term length.

Variables	Del_Ln(Total loan balance)$_{i,t}$	Del_Ln(the Big Five's loan balance)$_{i,t}$	Del_Ln(the Joint-Stock's loan balance)$_{i,t}$	Del_Ln(the CCBs' loan balance)$_{i,t}$
	(1)	(2)	(3)	(4)
5-TIO$_{i,t}$	0.578**	0.472**	0.038	0.467***
	(0.263)	(0.230)	(0.161)	(0.171)
5-TIO$_{i,t}$ Squared$_{i,t}$	−0.104**	−0.086**	−0.001	−0.079***
	(0.044)	(0.039)	(0.028)	(0.030)
Ln(GDP$_{i,t-1}$)	3.256***	2.912***	−0.014	1.669**
	(1.185)	(1.059)	(0.786)	(0.692)
GDP Growth Rate	−0.034	−0.038	−0.007	−0.012
	(0.044)	(0.039)	(0.018)	(0.025)
Sec_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.120**	−0.094**	0.017	−0.033
	(0.053)	(0.046)	(0.025)	(0.028)
Ter_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.091*	−0.071	0.026	−0.001
	(0.054)	(0.047)	(0.026)	(0.033)
Ln(Population)$_{i,t-1}$	−5.986	−4.737	−2.437	−3.358
	(8.818)	(7.875)	(5.991)	(5.859)
Ln(Investment)$_{i,t-1}$	0.028	0.115	0.092	0.096
	(0.463)	(0.403)	(0.229)	(0.243)
Year F.E.	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y
R-squared	0.098	0.099	0.166	0.117
Observations	1254	1254	1254	1254

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at city level.

Table 11
The effect of city leaders' political career on bank loans: using actual term length.

VARIABLES	Del_Ln(Total loan balance)$_{i,t}$	Del_Ln(the Big Five's loan balance)$_{i,t}$	Del_Ln(the Joint-Stock's loan balance)$_{i,t}$	Del_Ln(the CCBs' loan balance)$_{i,t}$
	(1)	(2)	(3)	(4)
Actual TIO	0.578**	0.472**	0.038	0.467***
	(0.263)	(0.230)	(0.161)	(0.171)
Actual TIO Squared$_{i,t}$	−0.104**	−0.086**	−0.001	−0.079***
	(0.044)	(0.039)	(0.028)	(0.030)
Ln(GDP$_{i,t-1}$)	3.256***	2.912***	−0.014	1.669**
	(1.185)	(1.059)	(0.786)	(0.692)
GDP Growth Rate $_{i,t-1}$	−0.034	−0.038	−0.007	−0.012
	(0.044)	(0.039)	(0.018)	(0.025)
Sec_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.120**	−0.094**	0.017	−0.033
	(0.053)	(0.046)	(0.025)	(0.028)
Ter_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.091*	−0.071	0.026	−0.001
	(0.054)	(0.047)	(0.026)	(0.033)
Ln(Population)$_{i,t-1}$	−5.986	−4.737	−2.437	−3.358
	(8.818)	(7.875)	(5.991)	(5.859)
Ln(Investment)$_{i,t-1}$	0.028	0.115	0.092	0.096
	(0.463)	(0.403)	(0.229)	(0.243)
Year F.E.	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y
R-squared	0.098	0.099	0.166	0.117
Observations	1254	1254	1254	1254

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at city level.

variable of Eq. (1) with three alternative explained variables: $Ln(Loan\ Balance_{i,t} - Loan\ Balance_{i,t-1})$, $(Loan\ Balance_{i,t} - Loan\ Balance_{i,t-1}) / GDP_{i,t}$ and $(Loan\ Balance_{i,t} - Loan\ Balance_{i,t-1}) / Loan\ Balance_{i,t}$. The other variables stay the same as in Eq. (1). We also control year and city-fixed effects. Standard errors are clustered at the city level.

Table 12 presents our baseline results with three new explained variables. As shown, using three different explained variables, we acquire a similar inverted U-shaped relationship between a city leader's predicted remaining time and city-level aggregated bank loans, and the turning points of the parabolas are 1.40, 1.25, and 1.11, respectively, which are consistent with our baseline results shown in Table 2.

Table 12
The effect of city leaders' political career on bank loans: alternative explained variables.

Variables	Ln(Total loan balance$_{i,t}$ - Total loan balance$_{i,t-1}$)	(Loan balance$_{i,t}$ – Loan balance$_{i,t-1}$) / GDP$_{i,t}$	(Loan balance$_{i,t}$ – Loan balance$_{i,t-1}$) / Loan Balance$_{i,t}$
	(1)	(2)	(3)
PRT$_{i,t}$	0.216**	0.055**	0.069**
	(0.096)	(0.022)	(0.032)
PRT Squared$_{i,t}$	−0.077**	−0.022***	−0.031***
	(0.033)	(0.008)	(0.011)
Ln(GDP$_{i,t-1}$)	0.097	0.170	0.016
	(0.558)	(0.110)	(0.178)
GDP Growth Rate	−0.032*	−0.001	0.011**
	(0.018)	(0.004)	(0.006)
Sec_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.007	−0.015**	−0.016*
	(0.024)	(0.006)	(0.009)
Ter_Ind$_{i,t-1}$/GDP$_{i,t-1}$	−0.049*	−0.013**	−0.012
	(0.027)	(0.007)	(0.010)
Ln(Population)$_{i,t-1}$	−1.668	−0.578	−0.002
	(2.091)	(1.217)	(1.249)
Ln(Investment)$_{i,t-1}$	0.414*	0.011	0.035
	(0.250)	(0.057)	(0.064)
Year F.E.	Y	Y	Y
City F.E.	Y	Y	Y
R-squared	0.795	0.221	0.341
Observations	1094	1254	1254

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at city level.

Table 13
Variables for background information on Chinese city leaders.

Panel A: Basic Information	Weight	Gain	Cover	Total Gain	Total Cover
age	30.0	11.2	528.9	337.1	15,866.0
ethnicity	8.0	9.5	462.4	76.3	3699.0
gender	3.0	11.6	377.3	34.9	1132.0
administrative rank	4.0	4.2	513.8	16.8	2055.0
whether she/he serves in province of origin	3.0	3.0	30.3	8.9	91.0
length of working	41.0	11.8	552.1	482.9	22,638.0
length of time in the party	42.0	8.2	454.9	345.3	19,106.0
Panel B: Education Experience	**Weight**	**Gain**	**Cover**	**Total Gain**	**Total Cover**
highest full-time degree	13.0	9.9	462.9	128.3	6018.0
highest part-time degree	23.0	11.7	575.0	269.0	13,224.0
major in the undergraduate study	11.0	6.8	363.7	75.2	4001.0
major in the highest part-time degree	9.0	7.1	119.9	64.2	1079.0
whether she/he has studied overseas	3.0	9.4	507.7	28.1	1523.0
Panel C: Working Experience	**Weight**	**Gain**	**Cover**	**Total Gain**	**Total Cover**
whether she/he has experience of "the rustication movement of China's educated youth"	3.0	3.8	17.0	11.3	51.0
whether she/he has worked in factories, companies, and other business sectors before being promoted to a public office with rank at the county level	3.0	7.4	448.3	22.1	1345.0
whether she/he has worked in local and subnational governments (M-form organizations) before being promoted to a public office with rank at the county level	3.0	6.9	346.7	20.8	1040.0
whether she/he has worked in the central government (U-form organizations) before being promoted to a public office with rank at the county level	2.0	11.6	702.0	23.1	1404.0
Panel D: Location Information	**Weight**	**Gain**	**Cover**	**Total Gain**	**Total Cover**
Three economic regions: east, central, and west region	1.0	3.5	41.0	3.5	41.0
Six geographic regions: north, northeast, east, central-south, southwest, and northwest region	2.0	6.1	611.0	12.3	1222.0

7.4. Location information used in machine learning method

Agents with limited attention usually focus on local information. Economic agents may be more likely to extrapolate the term of current leaders based on their predecessors in the same or neighboring area. However, while the random forest model is better suited to

Table 14
The effect of city leaders' political career on bank loans: prediction contains local information.

VARIABLES	Del_Ln(Total loan balance)$_{i,t}$	Del_Ln(the Big Five's loan balance)$_{i,t}$	Del_Ln(the Joint-Stock's loan balance)$_{i,t}$	Del_Ln(the CCBs' loan balance)$_{i,t}$
	(1)	(2)	(3)	(4)
$PRT_{i,t}$	0.406**	0.333**	−0.075	0.235*
	(0.194)	(0.167)	(0.108)	(0.128)
PRT Squared$_{i,t}$	−0.152**	−0.121*	0.024	−0.112**
	(0.075)	(0.065)	(0.043)	(0.051)
Ln($GDP_{i,t-1}$)	2.389**	2.160**	0.233	1.652**
	(1.080)	(0.971)	(0.822)	(0.719)
GDP Growth Rate $_{i,t-1}$	−0.037	−0.039	−0.006	−0.011
	(0.043)	(0.038)	(0.018)	(0.025)
$Sec\_Ind_{i,t-1}/GDP_{i,t-1}$	−0.092*	−0.072	0.012	−0.028
	(0.050)	(0.044)	(0.026)	(0.028)
$Ter\_Ind_{i,t-1}/GDP_{i,t-1}$	−0.067	−0.052	0.022	0.007
	(0.054)	(0.046)	(0.028)	(0.035)
Ln(Population)$_{i,t-1}$	−5.986	−4.715	−2.315	−3.139
	(8.993)	(8.028)	(6.061)	(5.999)
Ln(Investment)$_{i,t-1}$	0.093	0.159	0.051	0.074
	(0.469)	(0.406)	(0.230)	(0.239)
Year F.E.	Y	Y	Y	Y
City F.E.	Y	Y	Y	Y
R-squared	0.091	0.093	0.175	0.111
Observations	1254	1254	1254	1254

Notes: *, **, and *** denote 10%, 5%, and 1% levels of significance. Standard errors are clustered at city level.

small sample training, it does have certain inherent weaknesses. For example, if provincial or prefecture-level city information is used, the decision tree will have too many nodes (27 provinces and 278 prefecture-level cities), reducing training efficacy. Therefore, we do not use location information in the baseline machine learning training.

In the robustness tests, we include region information in model training and demonstrate the importance of each factor to the model. We divide locations into three economic regions and six geographic regions, with the classification results serving as feature variables in the machine learning model. Three economic regions include east, central, and west regions, and six geographic regions include north, northeast, east, central-south, southwest, and northwest regions. We demonstrate the importance of each factor to the machine learning training model. We employ four approaches to assess the contribution of the feature variables: Gain, Cover, Weight, and SHAP. Larger values indicate greater relevance. As shown in Table 13, the most essential features in predicting term length are age, length of employment, length of time in the party, and highest part-time degree. Location information is less important in comparison.

Matching the retrained predicted remaining term length to the bank loans, we find that the inverted U-shaped relationship still occurs between city leaders' predicted remaining time and city-level aggregated bank loans, as shown in Table 14. Among different types of banks, t the outstanding loan balance in the Big Five and CCBs show an inverted U-shaped relationship with a city leader's predicted remaining term length, but the Joint-Stock does not show a similar pattern. These findings are consistent with the baseline regression results reported in Table 2.

8. Concluding remarks

This paper investigates a new aspect of political uncertainty caused by term length uncertainty. China, with its varying de facto term lengths and unsynchronized timing of local authority turnover, provides an ideal institutional environment for studying how economic agents react to uncertain political term length. We use a machine learning method to predict the term length of city leaders by learning about others with similar backgrounds in order to capture economic agents' perceptions of political uncertainty when the actual turnover does not occur, and we investigate how these perceptions affect the behaviors of banks and firms.

Against the backdrop of China's pro-growth cadre evaluation, Chinese city leaders have a strong incentive to encourage banks to grant more loans to fuel economic growth, but their capacity to do so is constrained by political uncertainty perceived by banks and firms. When a new city leader takes office, economic agents wait until the policy map is clear; when a city leader is nearing the end of the predicted term length, economic agents refrain from new investment to avoid policy overturns when a power turnover happens. Thus, an inverted-U relationship between loan and investment expansion and city leaders' political careers appears, which matches the change of political uncertainty over the term of a city leader.

We also need to be aware of the potential adverse consequences of the politically mobilized loan and investment expansion. As local bureaucrats seek economic growth in the short term, they may be unaware of the long-term effect since they expect to have left the position by then. When banks are mobilized to issue more loans, they may overlook the risk, and the recipients of the loans may overinvest in inefficient projects, resulting in a loss of efficiency and a disruption in market order. When these happen, both banks and loan recipients are exposed to higher risk, as noted by Wang et al. (2019). This issue is certainly worthy of more detailed studies in the future. While political mobilization has helped China's growth, developing a more mature and balanced financial system may be a

better solution to facilitate economic growth in the long run.

CRediT authorship contribution statement

Yilei Qian: Data curation, Formal analysis, Methodology, Software, Writing – original draft, Writing – review & editing. **Feng Wang:** Conceptualization, Formal analysis, Funding acquisition, Supervision, Writing – review & editing, Methodology, Validation. **Muyang Zhang:** Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing, Methodology. **Ninghua Zhong:** Conceptualization, Funding acquisition, Resources, Supervision.

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Appendix A. Machine learning method

This study presents a machine learning method for predicting the term length of Chinese city leaders from 2007 to 2011 in our empirical samples. Our dataset contains the background information of all publicly available top leaders of prefecture-level cities in China who took office after 1990, including seven basic variables, five education-related variables, and four working-related variables (as shown in Table A1).[8] These variables have been proven to be strongly associated with the political careers of Chinese city leaders (Bo, 1996; Yao and Zhang, 2015; Wang et al., 2020).

Table A1
Variables for background information on Chinese city leaders.

	Variable	Explanation/Label
Basic Information	age	Age at the time of taking office
	ethnicity	1, Han; 2, Uyghur; 3, Hui; 4, Mongol; 5, Zang (Tibetan); 6, Zhuang; 7, Manchu; 8, other
	gender	0, male; 1, female
	administrative rank	1, prefecture; 2, sub-provincial
	whether she/he serves in her/his province of origin	1, Yes; 0, No
	length of working	Number of working years at the time of taking office
	length of time in the party	Number of years as a CPC member at the time of taking office
Education Experience	highest full-time degree	1, high school or below; 2, junior college; 3, college; 4, master; 5, doctor.
	highest part-time degree	0, none; 1, college; 2, graduate study; 3, MBA; 4, doctor
	major in the undergraduate study	1, engineering; 2, natural science; 3, arts, history and philosophy; 4, political science and law; 5, economics, management, and business; 6, other social science
	major in the highest part-time degree	1, engineering; 2, natural science;3, arts, history and philosophy; 4, political science and law; 5, economics, management, and business; 6, other social science
	whether she/he has studied overseas	1, Yes; 0, No
Working Experience	whether she/he has experience of "the rustication movement of China's educated youth"	1, Yes; 0, No
	whether she/he has worked in factories, companies, and other business sectors before being promoted to a public office with rank at the county level	1, Yes; 0, No
	whether she/he has worked in local and subnational governments (M-form organizations) before being promoted to a public office with rank at the county level	1, Yes; 0, No
	whether she/he has worked in the central government (U-form organizations) before being promoted to a public office with rank at the county level	1, Yes; 0, No

The dataset is then divided into two parts: set for training and set for predicting. The set for predicting consists of a sample of prefecture-level city leaders from 2007 to 2011 who are involved in our empirical regression; the set for training consists of the remaining city leaders.

We screen the samples entering the set for training to better estimate the predicted term length. First, we only keep the city leaders with an actual term length of 3–5 years, which is about 58% of full samples. This is due to the fact that, according to Chinese central government regulations, the statutory term length for city leaders is 5 years. Transfers are permitted midway through the term,

[8] Considering the integrity of term in the sample range, we delete the samples of top city leaders who were still in office by the end of 2017.

although a term is not counted until the city leader has served in the same position for three years. The more terms a city leader serves in the same career length, the greater the chances of political promotion. Therefore, we believe that when city leaders take office, they do not expect to leave before serving three years. Second, we eliminate the sample of uncommon departures, such as death and arrest in office. Finally, the set for predicting has 522 city leader samples, whereas the set for training includes 689 samples.

Then we use the random forest model to predict the term length of city leaders. The random forest model begins by creating a single leaf and then developing regression trees. Regression trees are trained individually using bootstrapped data, and their output is averaged to produce predictions. A regression tree is a form of decision tree that is used to estimate a continuous real-valued function rather than a classifier. The regression tree is built through an iterative process that divides the data into nodes or branches into smaller groups. Initially, all observations are assigned to the same group. The data is then divided into two partitions using every conceivable split on every available predictor. The predictor that splits the tree is the one that most clearly separates the observations into two distinct groups while also minimizing the residual error, which is measured in this study using the Friedman MSE established by Friedman (2001).

A random forest is made up of a number of decision trees, each of which has many decision nodes. In our application to forecast the predicted term length of Chinese city leaders, those decision nodes are city leaders' features, such as age, gender, and so on. Consider the following decision tree example in our study: whether a city leader is older than 55 predicts the change in predicted term length with the least error, and thus the age of 55 becomes the first splitting node. Thus, the sample is divided into two groups, one for city leaders over the age of 55 and another for those under the age of 55. In the first group (those over the age of 55), the variable with the lowest prediction error is the highest full-time degree, and it becomes the next splitting node. Major in the undergraduate is the variable with the lowest prediction error in the second group (those aged 55 and under), and it becomes the other splitting node. The sample is now divided into four groups, and the process is repeated until each group has a minimum number of observations (called a leaf in the literature). Using the entire sample and all possible splitting variables would almost certainly result in overfitting, so each tree only relies on a subsample of observations and each node only relies on a subsample of variables. Random forest, in turn, relies on a large number of trees to achieve robustness.

To obtain random forest predictions, the trees are built based on the steps outlined below.

Step 1. For m = 1 to M:

(1) Create a bootstrapped sample set, Z of size N, from the training data.

(2) Grow a random forest tree, T_m, for the bootstrapped data by repeating the following steps for each terminal node of the tree until the minimum node size, n_{min}, is reached.

i. Independently select m variables at random from all M possible variables
ii. Pick the best variable and split point among the m variables.
iii. Split the node into two daughter nodes. The split is decided in such a way that it minimizes MSE, which is calculated as follows:

$$F_0(x) = \frac{1}{n}\sum_{i=1}^{n}(y_i - \gamma)^2 \tag{A.1}$$

where y_i is an observed value and γ is a predicted value.

In addition to the bootstrapping unique data for each tree predictor, additional randomness is added at each node by randomly assigning a subset of variables to split the nodes. This random process greatly reduces the dependence between individual trees and improves flexibility against a potential overfitting problem.

Step 2. Output the ensemble of trees, $\{T_m\}_{\{m=1\}}^{M}$:

$$\widehat{F}^{M}(x) = \frac{1}{M}\sum_{m=1}^{M}T_m(x) \tag{A.2}$$

The final output is calculated by averaging the outputs of all the trees. Averaging over multiple predictions reduces the variance and stabilizes the trees' predictive performance.

Table A2 summarizes the year distribution of predicted term length-related variables in our empirical samples based on the random forest model predictions. Among 1254 city-year observations from 2007 to 2011, city leaders' average predicted term length is 3.80 years, which is close to the average actual term length in our empirical sample (4.07 years).

Table A2
The year distribution of predicted term length-related variables.

Year	Predicted Remaining Term Length	Predicted Term Length	Time in office
2007	1.34	3.83	2.76
2008	1.87	3.80	2.00
2009	1.38	3.80	2.55
2010	0.98	3.80	2.97
2011	1.22	3.80	2.77
Average	1.36	3.80	2.61

The code for the machine learning methods used in this article is detailed in https://github.com/leo1998tj/Predicted_term_length.

Appendix B. The share distributions of three types of banks

Table B1
The share distributions of several CCBs in 2008 (top 10 shareholders).

Serial No.	Name of Shareholders	Share Proportion (%)
Panel A: Bank of Nanjing		
1	Nanjing State-owned Assets Investment & Management Holding (Group) Co., Ltd.	13.6
2	BNP Paribus	12.6
3	Nanjing Gaoke Co., Ltd.	11.2
4	International Finance Corporation	2.4
5	Jinling Pharmaceutical Co., Ltd.	1.1
6	Sinopec Finance Co., Ltd.	1.1
7	Nanjing Textile Industry (Group) Co., Ltd.	1.1
8	Jiangsu Guoxin Investment (Group) Co., Ltd.	1.1
9	Suyan (Group) Co., Ltd.	0.8
10	Anbang Property & Casualty Insurance Co., Ltd.	0.6
Panel B: Bank of Ningbo		
1	The Finance Bureau of Ningbo	10.8
2	Ocbc Bank	10.0
3	Ningbo Fubang Holding Group Co., Ltd.	7.2
4	Ningbo Shanshan Co., Ltd.	7.2
5	Huamao Group Co., Ltd.	7.2
6	Youngor Group Co., Ltd.	7.2
7	Ningbo Electric Power Development Company	7.2
8	Credit Suisse (Hong Kong) Limited	2.4
9	Ningbo Yunsheng Co., Ltd.	2.4
10	Zhejiang Zhuoli Electric Appliance Group Co., Ltd.	2.2
Panel C: Bank of Hangzhou		
1	Commonwealth Bank of Australia	20.0
2	The Finance Bureau of Hangzhou	16.7
3	Hangzhou Steam Turbine Co., Ltd.	8.8
4	Hangzhou Financial Development and Investment Group Co., Ltd.	8.3
5	Asian Development Bank	5.0
6	Hangzhou KAWAI Electric Co., Ltd.	4.9
7	Qiantang Real Estate Group Co., Ltd.	3.5
8	Zhejiang Hengli Real Estate Group Co., Ltd.	3.0
9	The Finance Bureau of Hangzhou Yuhang District	1.5
10	The Finance Bureau of Hangzhou Economic-Technical Area	1.5

Notes: There are more than 100 city commercial banks in China. We selected three listed CCBs with top asset scale for representativeness, showing their top 10 shareholders at the end of 2008.
Sources: Top 10 shareholder statistics of the CCBs from their 2008 annual reports.

Table B2
The state share proportions of the Big Five in 2008 (top 10 shareholders).

Bank Name	Government (%)	Central Huijin (%)	Other SOEs (%)
Industrial & Commercial Bank of China (ICBC)	35.3	35.4	–
Bank of China (BOC)	3.3	67.5	–
China Construction Bank (CCB)	–	57.1	1.3
Agricultural Bank of China (ABC)	50.0	50.0	–
Bank of Communications (BCM)	26.5	–	5.4

Notes: "Government" refers to China's Ministry of Finance and National Council for Social Security. Central Huijin Investment Co., Ltd. (Central Huijin) is a solely state-owned investment company, which is mandated by the State Council to exercise its rights and obligations as an investor in some important state-owned financial enterprises (mainly in state-owned commercial banks). Among the Big Five, BCM's ownership structure is relatively diversified, but state-owned shares still account for more than a quarter of the total shares.
Sources: Top 10 shareholder statistics of the Big Five from their 2008 annual reports.

Table B3
The share distributions of several Joint-Stock banks in 2008 (top 10 shareholders).

Serial No.	Name of Shareholders	Share Proportion (%)
Panel A: China Merchants Bank		
1	HKSCC Nominees Ltd.	17.8
2	China Merchants Steam Navigation Co., Ltd.	12.4
3	China Ocean Shipping (Group) Company	6.4
4	Guangzhou Maritime Transport (Group) Co., Ltd.	3.8
5	Shenzhen Yanqing Investment and Development Co., Ltd.	3.0
6	Shenzhen Chuyuan Investment and Development Co., Ltd.	2.6
7	China Communications Construction Co., Ltd.	1.8
8	Shanghai Automotive Industry Corporation	1.7
9	CNOOC Investment Co., Ltd.	1.4
10	Qinhuangdao Port Group Co., Ltd.	1.2
10	China Shipping (Group) Company	1.2
10	Shandong State-owned Assets Investment Holdings Co., Ltd.	1.2
10	Guangdong Provincial Highways Administration Bureau	1.2
Panel B: Shanghai Pudong Development Bank		
1	Shanghai International Group	23.6
2	Shanghai International Trust Co., Ltd.	7.3
3	Citibank Overseas Investment Corporation	3.8
4	Shanghai Guoxin Investment & Development Co., Ltd.	2.8
5	Bank of Communications	1.7
6	Bailian Group Co., Ltd.	1.4
7	China Tobacco & Cigarette Group Jiangsu Branch	1.2
8	Industrial and Commercial Bank of China	0.9
9	Industrial Bank	0.9
10	Shanghai Postal Corp.	0.9
Panel C: China CITI Bank		
1	CITIC Group	62.3
2	Hong Kong Securities Clearing Company Nominees Limited	15.7
3	Gloryshare Investment Limited	9.9
4	Banco Bilbao Vizcaya Argentaria	5.1
5	China Construction Bank	0.4
6	Mizuho Corporate Bank	0.2
7	National Council for Social Security Fund	0.2
8	PICC Property and Casualty Co., Ltd.	0.2
9	China Life Insurance (Group) Company	0.1
10	China Life Insurance Co., Ltd.	0.1
Panel D: Industrial Bank		
1	The Finance Bureau of Fujian Province	20.8
2	Hang Seng Bank Limited	12.8
3	Tetrad Ventures Pte Ltd.	4.0
4	COFCO Limited	2.9
5	Fujian Tobacco Haisheng Investment Management Co., Ltd.	2.7
6	International Finance Corporation	2.1
7	China Electronic Information Industry Group Corporation	2.0
8	Shanghai Industrial Investment Holdings Company	1.6
9	Inner Mongolia Xishui Venture Co., Ltd.	1.5
10	Sept-wolves Investment Co., Ltd.	1.5

Notes: There are 12 nationwide listed joint-stock commercial banks in China. We selected four joint-stock commercial banks with a top asset scale for representativeness, showing their top 10 shareholders at the end of 2008.
Sources: Top 10 shareholder statistics of the Joint-Stock from their 2008 annual reports.

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