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# Political promotion and labor investment efficiency<sup>☆</sup>

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## ABSTRACT

This study investigates the effect of political promotion incentives on the labor investment efficiency of firms by focusing on human capital misallocation. We show that 1) promotion incentives of local politicians significantly increase firm-level employment growth and decrease labor investment efficiency. 2) Causality is established using the number of death toll in local mining accidents to isolate exogenous shocks on the promotion incentives of local politicians, and placebo tests further confirm the causality. 3) For under-hiring firms, promotion incentives only increase the employment of low human capital, thus distorting human capital structure and decreasing labor investment efficiency. 4) Our findings are robust to alternative specifications. Overall, we highlight the political economy channel of human capital misallocation from the perspective of career concerns of local politicians.

## 1. Introduction

Considering that human capital is the most important factor that determines firm productivity (Erosa, Koreshkova, & Restuccia, 2010; Lazear, 2009; Moretti, 2004), investment efficiency of human capital is essential for a firm sustaining competitive advantage and high productivity level. However, there has been a great deal of literature on the factors affecting the capital market investment, such as information asymmetry in capital markets affects firm investment decisions and often results in inefficiencies in the form of over- and under-investment (Hubbard, 1998; Stein, 2001). Probably due to the data unavailability, prior studies mainly focus on the investment efficiency of capital expenditure,<sup>1</sup> and there is surprisingly little empirical evidence examining the determinants of labor investment efficiency (Pindyck, 1988; Koeniger & Leonardi, 2007; Pinnuck & Lillis, 2007; Jung, Lee, & Weber, 2014; Alesina, Battisti, & Zeira, 2018; Ben-Nasr & Alshwer, 2016; Ghaly, Dang, & Stathopoulos, 2015).

This study attempts to fill the above gap in the literature. In particular, we investigate the determinants of labor investment efficiency from a novel channel, i.e., promotion incentives of politicians. This investigation is economically significant because labor costs typically represent roughly two-thirds of economy-wide value added (Jung et al. (2014)), and labor investments are more

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<sup>1</sup> For example, Hayashi and Inoue (1991); Hubbard (1998); Walker (2005); Richardson (2006); Biddle, Hilary, and Verdi (2009); Liang and Wen (2007); Erickson and Whited (2000); Nan and Wen (2014); Chari and Henry (2008) and Hall (2016).

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flexible and reversible than capital investments (Pinnuck and Lillis (2007); Hall (2016)). For example, the U.S. Census Bureau's Annual Survey of Manufacturers reports that the payroll and employee benefits in the manufacturing sector totaled \$829 billion in 2015 but capital expenditures only amounted to \$263 billion.<sup>2</sup> In China, the labor adjustment is costly. For example, in January 2008, China adopted a new “Labor Contract Law of the People's Republic of China”. The law requires employer to provide employees with written contracts that contain the term of employment, wages, social insurance, labor protections and so on. This new law includes not only employment contract viscosity, but also the minimum wage and the broad pay more of the economic compensation when firms dismiss employees. That means China's labor adjustment is very costly because it has legal barrier. Some related studies discuss on relevant issues. For example, Cooper et al. (2012) demonstrate that one of the most economically important provisions is the requirement of severance payment, and the severance is twice the amount (the basic amount specified in the law) if a contract is terminated unlawfully. They also point that in China, increased severance payments lead to a reduction in productivity, since re-allocation is very costly. Chen and Funke (2009) claim that the improvements design to protect workers from casualization and arbitrary firings would raise costs for employers by raising requirements for severance pay, and they view the law as the twilight of the age of cheap labor in China.

Meanwhile, the economic consequence of incentives from political promotion on labor investments has yet to be investigated.

We conduct our study based on the Chinese stock market, which is an ideal laboratory to investigate the effect of promotion incentives on labor investment efficiency (*LabEff*) for the following reasons:

- 1) Firm productivity in China is relatively low compared with that in developed markets. Related studies argue that input misallocation can be an important reason for low productivity level (Hsieh and Klenow (2009); Bartelsman, Haltiwanger, and Scarpetta (2013); Restuccia and Rogerson (2013)). Recently, Li, Loyalka, Rozelle, and Wu (2017) argue that future economic growth of China requires higher human capital. As the second largest economy worldwide, Chinese economy has been growing at nearly 10% since it embraced economic reforms more than 30 years ago. Therefore, investigating the labor investment efficiency and human capital misallocation in China is an important research agenda with economic significance.
- 2) Promoting employment has always been the goal of China's central government, and, thus, local politicians are pressured to increase employment. For example, on September 9, 2014, Chinese premier Keqiang Li responded to Klaus Kleinfeld (CEO and chairman of Alcoa Corporation): “Everyone is concerned about China's economic growth data, but for the Chinese government, the greatest concern is about the employment situation in China.” In 2012, the former president of China Jintao Hu also emphasized: “employment is the foundation of people's livelihood, and promoting employment is the top priority for ensuring and improving people's livelihood.”<sup>3</sup> Accordingly, in all three versions (2006, 2009, and 2013) of “Comprehensive Appraisal System of the Local Party and Government Leading Bodies and Leading Cadres (for Trial Implementation),” the performance evaluation of politicians (Chapter 6) clearly requires that the evaluation criteria should include the levels of local economy, employment (unemployment rate), and household income. Local firms are greatly incentivized to build “intimate” relationship with the local government because local governments control land, capital, and other important resources and possess approval authority to major investment projects. When the central government requires improving employment rate and controlling unemployment as macroeconomic indicators, local governments will exert/transfer this pressure to local firms. In addition, local firms may also intentionally cater to their political allies by altering their hiring decisions toward the targets of the government in an attempt to obtain future benefits in return,<sup>4</sup> i.e., exchange of favors between politicians and firms.
- 3) Data in China allow us to identify human capital structure at firm level. To explore the underlying mechanism between promotion incentives and *LabEff*, we hand-collect the educational level of employees at firm level and introduce the human capital structure to investigate whether the hiring behavior of firms distorts labor structure.

Based on the aforementioned arguments, we conjecture that local politicians subject to promotion incentives will transfer political pressure to local firms and further affect the human capital level and *LabEff* of local firms.

To test the above hypothesis, we manually retrieve the turnover of local government officials at city level and define a dummy variable, *Promotion*, to identify years with the highest incentives of promotion for the local politician (Bo (1996); Li and Zhou (2005); Piotroski, Wong, and Zhang (2015); Piotroski and Zhang (2014)). Following Pinnuck and Lillis (2007) and Jung et al. (2014), We use firms' net hiring (percentage change in the number of employees) to measure investment in labor, and then we define investment efficiency by using absolute values of differences between observed (actual) labor investment and expected labor investment, which is predicted and justified by economic fundamentals. A higher deviation of labor investment from its predicted value indicates lower labor investment efficiency. Thus, our measure of abnormal net hiring captures the amount of net hiring not attributable to underlying economic factors.

First, we find that political promotion facilitates inefficient net hiring. By comparing the actual and expected net hiring, we divide the sample into two subgroups: over- and under-hiring firms. For over-hiring firms, impending political promotions decrease (increase) labor investment efficiency (inefficiency), which is straightforward: local politicians are pressured to increase employment at

<sup>2</sup> <http://factfinder.census.gov/bkmk/table/1.0/en/ASM/2015/31GS101>

<sup>3</sup> Attaching great importance to employment, the Chinese central government formulated a series of policies and measures for increasing employment to maintain the basic stability of the employment situation. China exerts great efforts to increase employment level. For example, the Chinese central government issued “Employment Promotion Law of the People's Republic of China” on August 30, 2007, and “The New Labor Contract Law” became effective on January 1, 2008.

<sup>4</sup> Faccio and Hsu (2017) also find evidence of high job formation at establishments operated by the targets of politically connected firms than those operated by targets of non-connected firms, thus supporting stories about exchange of favors.

firm level. Therefore, hiring more employees will decrease labor investment efficiency when a firm is already over hiring. Heckman (2003) finds that in China, people with higher levels of education are better able to absorb new ideas, adapt to foreign technologies, improve local technologies, understand and apply knowledge from outside China to local situations. Based on Heckman (2003), and given that the high employment ratio is beneficial for the promotion of local politicians, we further argue that political promotion incentives drive firm hiring more human capital with low level, who are more likely to be unemployed and might not bring significantly increase of firm operation efficiency. In this case, we expect that the political promotion will eventually result in decreases of the investment efficiency of labor. From the perspective of allocation of firm resources, we label this situation as human capital misallocation.

By contrast, for under-hiring firms, *Promotion* significantly decreases labor investment efficiency. Intuitively, we expect under-hiring firms to benefit from the increase of employment level. To further explore the underlying mechanism, we divide employees into three types (i.e., employees with degree below bachelor, bachelor degree, and master degree or above) at firm level. We provide supportive evidence on the misallocation of human capital structure. In particular, we examine which education level of employees increase when local officials have political promotion incentive, and find that local firms will hire more employees with degree below bachelor. Therefore, even though hiring of high human capital might increase the labor investment efficiency of firms, under-hiring firms only increase with the employment of low human capital.

Second, to address endogeneity and establish causality, we introduce an instrumental variable (IV) for *Promotion*. One concern for our baseline results is the reverse causality. In such case, our finding may reflect the association between labor investment efficiency and political promotion rather than the causal effect of promotion incentives on labor investment efficiency.

The IV for *Promotion* is the death toll in coal mining accidents. The high mortality rate in Chinese coal mines attracts attention of the government and scholars.<sup>5</sup> A number of media reports show that mine deaths affect the promotion of local politicians. For example, in 2005, two deputy provincial governors are dismissed, and 96 officials are prosecuted for coal mining accidents.<sup>6</sup> Mine accident is strongly exogenous to *LabEff*, and we believe that mine accident in local city is less likely to affect the labor investment of other firms in the same city. We manually collect mining accident data from the government website of State Administration of Work Safety. The mining accident datasets contain information about the time, number of fatalities, and economic classification of accidents in each city.

The results are highly consistent with our baseline results, providing supportive evidence for causality. We also employ a placebo test to further address the concerns.

Third, in robustness checks, 1) we divide our promotion events into subgroups: the promotion of municipal party committee secretaries and mayors. We find that the promotion of both municipal party committee secretary and mayor significantly affect labor investment efficiency. 2) Given that firms may directly be administrated by a higher level of government (e.g., central or provincial government), we exclude firms in Beijing and other provincial capitals to clearly identify the effect of political promotion incentives on the labor investment efficiency of local firms. The results hold after excluding firms in such locations.

Finally, we further investigate cross-sectional variations. 1) One important feature of Chinese firms is that most are owned by the state. We find that the effect of *Promotion* on *LabEff* is slightly higher in state-owned firms than that in non-state-owned firms. 2) Although the National Congress of the Communist Party of China (NCCPC) is the biggest political event in China (Piotroski and Zhang (2014)), the effect of *Promotion* on *LabEff* is only slightly higher during NCCPC than that during periods without NCCPC. 3) The influence of regular promotion on *LabEff* is greater than that of promotions before the expiration of the term.

This study contributes to the broad literature on the determinants of human capital (Zabojnik and Bernhardt (2001); Ang, Slaughter, and Ng (2002); Sabirianova (2002); Meckl and Zink (2004); Bapna, Langer, Mehra, Gopal, and Gupta (2013); Chemmanur, Cheng, and Zhang (2013); D'Erasmo, Boedo, and Šenkál (2014); Jung et al. (2014); Popov (2014)) and growing literature on the consequences of political promotion (Piotroski and Zhang (2014); Piotroski et al. (2015)). We show that incentives arising from the career concerns of local politicians significantly affect the allocation efficiency of human capital at firm level. Our results highlight one political economy channel on the determinants of labor investment efficiency at this level. We find that the effect of politicians' promotion incentives on firm's labor investment efficiency depends on prevailing institutional arrangements. On one hand, when politicians' performance is evaluated on the basis of employment ratio, politicians achieve specific government objectives by shaping the employment level of local firms. On the other hand, if economic activities are influenced by political factors and government intervention, then firms lack efficient investment on labor hiring, thereby resulting in human capital misallocation.

This study also provides clear policy implications for governments in emerging market economies concerned about the efficiency of labor investment and optimization of human capital allocation. Our results call attention to the urgency for regulators in developing economies to focus on the human capital structure at firm level when improving employment rate.

The rest of the paper is organized as follows. Section 2 presents the institutional background and reviews the literature. Section 3 explains the data and variables. Section 4 analyzes the empirical results and identifies causality. Section 5 conducts cross-sectional examinations, and Section 6 concludes.

<sup>5</sup> The coal mining industry in China is the deadliest in the world in terms of human safety; thousands of people die annually in coal pits (Jia and Nie (2017)). Fisman and Wang (2015) find that the worker death rate in workplace is closely related to the political connections between Chinese firms and governments. Nie and Zhao (2015) find a close relationship between accident mortality and local governments.

<sup>6</sup> <https://www.rferl.org/a/1064107.html>

## 2. Institutional background and literature review

### 2.1. Political promotion system in China and related studies

The political promotion system in China has undergone several amendments to organize and manage governments in different levels. Since the Central Committee of the Communist Party of China promulgated the “Provisional Regulations on Selection and Appointment Work of Party and Government Leading Cadres” in February 1995, the Chinese government has issued a series of evaluation criteria and regulations. In February 2002, the Chinese central government enacted a formal version of the regulations for selecting and appointing the leading cadres of the party and government. According to “Opinions on Establishing the Appraisal Mechanism of the Party and Government Leading Bodies and Leading Cadres for Scientific Development” and other relevant laws and regulations, the central government has gradually decreed and updated the criteria for evaluating the performance of local politicians in 2006, 2009, and 2013. The updated set of criteria is called “Comprehensive Appraisal System of the Local Party and Government Leading Bodies and Leading Cadres (for Trial Implementation).” Chapter 6 clearly requires that the evaluation system should cover many aspects, including the growth of local economy; employment (unemployment rate); income of urban and rural residents; regional economic development gap; education; energy saving, and population and so on.

At present, the promotion of political officials in China has two groups of views. The first strand of literature (Zhou (2007)) explains the promotion system of local politicians in China on the basis of tournament theory. In China, the administrative system is constituted by five levels, i.e., central, provincial, city, district, and country governments. Tournament effects may be observed in the evaluation of subnational leaders. In each level of the administrative system, the appraisal of local politicians is based on the GDP growth, which is further linked with political promotion. If the central government set a growth target, then provincial governments will pursue a higher growth target to win the competition for political promotion. To fulfill the target, the provincial government will schedule the task and employ the tournament system in lower government levels.

Numerous studies also support that higher authorities evaluate local officials mainly on the basis of the performance of local economic development. Some studies examine the tournament-like regional competition from the angle of regionally decentralized authoritarian (RDA). Xu (2011) first proposes the conception of RDA, and argue that the central governments has highly centralized over personnel, whereas resources and economic decentralization. The regional competition and experimentation governed by China's RDA regime effectively alleviated potential incentive and informational problem (Xu, 2011, 2015). Wan, Ma, and Zhang (2015) demonstrate that the centralized governance structure and fiscal decentralization encourage the central government to manipulate intergovernmental transfers to achieve their national objectives, and a party secretary's replacement facilitates an increase in transfers.

There are a number of literature on policy burdens. Policy burdens are imposed by the governments and often induce low effort input of firm manager and result in low efficiency of production. In particular, state-owned enterprises (henceforth SOEs) in China often undertake various policy burdens, such as retaining redundant workers and responsible for their employees' retirement pensions, housing, medical cares and other needs (Lin, Cai, & Li, 1998; Lin & Li, 2008). Liao, Chen, Jing, and Sun (2009) argue that the social security system of China is still immature and often fails in providing sufficient unemployment aids, which causes social instability and damages the whole economy. In order to access to more resources, firms tend to share more of the burdens for the State. In addition, listed firms controlled by local governments face more pressure in hiring redundant workers since creating employment is one of the major objectives of local governments. For example, Lin and Tan (1999) point out that in a socialist state, one way the governments achieve political support is creating jobs. Blanchard and Shleifer (2001) find that the Chinese central government is willing to reward or punish local officials based on the economic performance in their region for promoting local economic development. Persson and Zhuravskaya (2016) distinguish the performance of outsiders and local party secretaries when they make governance decisions. They also find that promotion mechanism rewards infrastructure and construction, but not investments in education and health care and local party secretaries are significantly less likely to be promoted than outsiders. Jia (2017) use political connections between local governors and key officials at the political center as a source of variation to formalize a simple career-concerns model. She also reports that politicians' incentives can partly explain China's high environmental pollution level, because economic growth is relevant for their chance of promotion. Jia, Kudamatsu, and Seim (2015) argue that political connections foster loyalty of junior officials to senior ones, allowing the incumbent top politicians to promote the most able ones among those connected. Shih, Adolph, and Liu (2012) think that Chinese leaders do not find provincial officials who generated higher-than-average growth or higher than expected growth were rewarded with higher party ranks.

The second strand of literature argues that economic growth does not play a direct role in the appraisal system of politicians in China (Tao, Sue, Lu, and Zhu (2010)). First, if tournament works in political promotion, then measurable and objective criteria for competition should be observed (e.g., GDP growth rate). If the political promotion of subordinate officials is directly associated with these measurable and objective criteria, then the higher authorities will relatively lose control on political turnover, which is contrary with the fact that the central government possesses the ultimate control to appoint subordinate officials in China. As a result, the tournament effect on political promotion is incompatible with the operation mechanism of centralized political system. Second, after the 1990s, the role of provincial governments has attenuated with the growth of local economy. Believing that the economic growth rate of a province is mainly determined by provincial officials is challenging given the considerable difference of economic base and scale across various provinces in China. Shih et al. (2012) think that Chinese leaders do not find provincial officials who generated higher-than-average growth or higher than expected growth were rewarded with higher party ranks in any year and on any measure. Landry (2003) finds no evidence indicate that local economic growth significantly affects the promotion of a mayor at city level. Opper and Brehm (2007) find that provincial officials with specific work experience after 2002 tend to be promoted, and most of

them are appointed by the central government. Therefore, the aforementioned studies do not support the argument that economic performance affects the political promotion of local officials.

In summary, the existing literature mainly focuses on exploring the driving force of Chinese economic growth. However, rare studies directly investigate the influence of the political promotion of local officials on labor investment efficiency at firm level. During the transformation of government functions, beyond GDP growth, the Chinese government is concerned about the livelihood of the people, thus indicating the necessity to further investigate the influence of political promotion incentives on corporate decisions in microeconomics.

## 2.2. Labor investment efficiency

“Studies directly related to labor investment efficiency are relatively limited. In this paper, we especially focus on studies related to labor investment. First, the importance of labor as a production input has increased dramatically in recent years. At the firm level, human capital plays an increasingly significant role in determining firms' competitive success, particularly in areas such as innovation and product development (Pfeffer, 1994; Zingales, 2000). Second, maintaining an optimal level of labor investments is important to a firm (Pinnuck & Lillis, 2007) because any deviation from this optimal level will have a negative impact on the firm's future operating performance and destroy its shareholders' wealth (Ghaly et al., 2015). In this paper, following Pinnuck and Lillis (2007), Jung et al. (2014), and Ben-Nasr and Alshwer (2016), we use firms' net hiring, measured as the percentage change in the number of employees to proxy for investment in labor. We then measure labor investment efficiencies (LabEff) as the absolute deviation of actual net hiring from its expected (optimal) level predicted by economic fundamentals. Therefore, our measure of abnormal net hiring captures the amount of net hiring not attributable to these underlying economic factors. The bigger the absolute deviation is, the lower firms' labor investment efficiency. Our main estimate of a firm's expected level of net hiring is based on the labor demand model of Pinnuck and Lillis (2007). This model uses an extensive list of economic firm-specific variables to explain normal hiring practices. Prior literature shows that the investment of firms in labor is affected by shocks to the financing constraints of firms (Cantor, 1990; Sharpe, 1994; Campello, Graham, & Harvey, 2009; Benmelech, Bergman, & Seru, 2011). Some scholars discuss how to improve labor investment efficiency from various perspectives (Alesina et al., 2018; Ben-Nasr & Alshwer, 2016; Jung et al., 2014; Koeniger & Leonardi, 2007; Pinnuck & Lillis, 2007).

## 2.3. The importance of human capital

Most scholars study the mismatching of production factors and propose theoretical models. For example, Dollar and Wei (2007) argue that factor mismatch and invalid configuration are common in developing countries, and they demonstrate that reducing the mismatch factor can improve the level of economic output and production efficiency. Existing studies on human capital misallocation mainly focus on the industrial level and there is little research about China. Theoretically, Baumol (1990) point that at any time and place, the magnitude of the benefit the economy derives from its entrepreneurial talents depends substantially on the allocation of this resource between productive and unproductive entrepreneurial activities. If the adjustment of game rules induces more felicitous allocation of entrepreneurial resources, then the policymaker's task is less formidable and not hopeless. Lagos (2006) constructs an aggregative model of total factor productivity by introducing labor market frictions and posits that labor market policies, such as employment size, employment subsidies, unemployment benefits, and dismissal allowances, affect the level of labor mismatch. Some studies are only indirectly related to human capital allocation. For example, Baltagi and Rich (2005) argue that companies are willing to hire skilled labor because of their strong adaptability. Li et al. (2017) find that since the economic reform in 1978, human capital has played an important role in the economic success of China. Although China is no longer a low-income country chasing middle-income states, the labor force is still lack of skills or human capital that is required in a high-wage, high-skill, and innovation-based economy.

To sum up, although the Chinese government has been aware of the importance of human capital, it has not paid attention to the correct allocation of human capital to optimize efficiency on firm-level, and the existing literatures provide limited evidence on the mismatch of human capital from an empirical view.

## 2.4. Political promotion and employment decisions

Promoting employment has always been the goal of China's central government, and, thus, local politicians are pressured to increase employment. Local firms are greatly incentivized to build “intimate” relationship with the local government because local governments control land, capital, and other important resources and possess approval authority to major investment projects. When the central government requires improving employment rate and controlling unemployment as macroeconomic indicators, local governments will exert/transfer this pressure to local firms. Based on the aforementioned arguments, we conjecture that local politicians subject to promotion incentives will transfer political pressure to local firms and further affect the *LabEff* of local firms, and we analyze this question from the view of human capital. This question is the primary focus of our study and is summarized by the following hypothesis:

**Hypothesis 1.** *Political promotion incentives of local politicians significantly increase firm-level employment growth and reduce labor investment efficiency.*

### 3. Data and variables

#### 3.1. Data sources

Our data are compiled from several resources. To create a sample of political promotion events capable of shifting economic incentives on a city level, we manually collect political turnover events in each city from China Economic Information Network (<http://www.cei.gov.cn>). Following An, Chen, Luo, and Zhang (2016), we also check the political turnover events from various public resources, such as newspapers, websites, press releases, and other announcements. This method involves the transfer, re-assignment, promotion to a position with higher political power, demotion to a position with lower political power, or retirement of either the municipal party committee secretary or mayor. Specifically, we compile the year and monthly information of each turnover event, political positions before and after each turnover event, and personal information of the politicians, including gender, birth date, origin, education degree, and university. In empirical tests, we mainly focus on promotion events of local politicians.

Second, we manually retrieve employment and education data at firm level in each year from annual reports of listed firms. In particular, we collect the total number of employees and the number of employees with degree below bachelor, with bachelor degree, and with master degree or above.

Third, firm-level financial and accounting data are collected from the database of the China Securities Market & Accounting Research (CSMAR), which is a popular database for China-related studies. To construct the measure of firm's labor investment efficiency and control variables, we obtain the information of firm's market capitalization, total sales, net income, cash and short-term investment, receivables, total assets, current liabilities, and long-term debts at firm-year level. To match the data of political promotion events, we also collect the location of listed firms' headquarters from the CSMAR database.

To ensure the validity of empirical tests, we use the following procedures to form the sample. We first exclude all listed firms in the financial industry. Second, we exclude listed firms with employees less than 30, or listed firms with unreasonable financial data, such as negative total assets, negative current liabilities, negative long-term liabilities, or leverage ratio above 1. We require firms to have complete employee education information to analyze human capital misallocation. We also require firms to have financial information for at least two consecutive years so that we can calculate the changes in employment and sales. All continuous variables are winsorized at the 1st and 99th percentiles. Our final sample consists of 12,514 firm-year observations from 2002 to 2016.

#### 3.2. Variable definitions

##### 3.2.1. Incentives of political promotion

To create a sample of political promotion events capable of shifting economic incentives in a city, we manually collect all political turnover events of either the municipal party committee secretary or mayor in each city, including the transfer, reassignment, promotion to a position with higher political power, demotion to a position with lower political power, or retirement. Specifically, we compile the year and monthly information of each turnover event, political positions before and after each turnover event, and personal information of the politicians, including gender, birth date, origin, education degree, and university.

In our sample, we incorporate three types of political promotions: a promotion of the mayor or party committee secretary in the city to political positions in central ministries, a promotion of the mayor or party committee secretary in the city to a provincial position with more political power in the same or other provinces, or a promotion of the mayor in the city to party committee secretary in the same or other cities.

When identifying the promotion incentives, we follow Bo (1996), Li and Zhou (2005), Piotroski et al. (2015), and Piotroski and Zhang (2014). Specifically, if a local politician get promotion between January 1 and June 30 in year  $t$ , then we define the prior year  $t-1$  as the year with the highest incentives for the local politician, and *Promotion* takes the value of one. If a local politician get promotion between July 1 and December 31 in year  $t$ , then we define the current year  $t$  as the year with the highest incentives for the local politician, and *Promotion* takes the value of one.

These promotion events are visible and anticipated by economic agents in the city. Politicians and affected firms have a well-defined window over which these incentives arise and promotion-influenced decisions can be made because of the planned nature of political transitions in China. Although promotion events in our sample are observed ex post, our research design is predicated upon these events before the events occur.

##### 3.2.2. Labor investment efficiency

As a substitute for firm investment in labor, we use net hiring of a firm, which is reflected by the percentage change in the number of firm employees (Pindyck (1988); Jung et al. (2014)). Following Jung et al. (2014), we further measure labor investment efficiencies based on the abnormal level of firm's net hiring. Conceptually, the abnormal net hiring is defined as the difference between the actual change and the expected change in a firm's labor force. According to Pinnuck and Lillis (2007) and Jung et al. (2014), we introduce the following model to calculate the expected change in a firm's labor force, which is derived from firm's fundamental information:

$$\begin{aligned}
NetHire_{it} = & \beta_0 + \beta_1 SalesGrowth_{it-1} + \beta_2 SalesGrowth_{it} + \beta_3 ROA_{it-1} \\
& + \beta_4 ROA_{it} + \beta_5 \Delta ROA_{it} + \beta_6 SizeR_{it-1} + \beta_7 Quick_{it-1} + \beta_8 Quick_{it} \\
& + \beta_9 \Delta Quick_{it} + \beta_{10} Lev_{it-1} + \beta_{11} Lossbin1_{it-1} + \beta_{12} Lossbin2_{it-1} \\
& + \beta_{13} Lossbin3_{it-1} + \beta_{14} Lossbin4_{it-1} + \beta_{15} Lossbin5_{it-1} \\
& + Industry\ and\ Year\ Fixed\ Effect + \varepsilon_{it}
\end{aligned} \tag{1}$$

where  $i$  denotes a firm and  $t$  denotes a year.  $NetHire_{it}$  is the percentage change in the number of employees from year  $t-1$  to  $t$  for firm  $i$ .  $SalesGrowth_{it}$  is the percentage change in sales from year  $t-1$  to  $t$  for firm  $i$ .  $ROA_{it-1}$  is the return on assets, measured as net income scaled by total assets at the beginning of the year for firm  $i$  in year  $t-1$ .  $SizeR_{it-1}$  is the percentile rank of the market capitalization in year  $t-1$  for firm  $i$ .  $Quick_{it-1}$  is the quick ratio, measured as cash and short-term investments plus receivables scaled by current liabilities in year  $t-1$  for firm  $i$ .  $Lev_{it-1}$  is the leverage ratio, measured as long-term debts scaled by total assets at the beginning of the year for firm  $i$  in year  $t-1$ . We also include five separate loss bins to indicate each 0.005 interval of  $ROA$  from 0 to  $-0.025$  in year  $t-1$  for firm  $i$ . According to Jung et al. (2014) and Pinnuck & Lillis, 2007,  $Lossbin1_{it-1}$  is equal to 1 if  $ROA_{it-1}$  ranges from  $-0.005$  to 0, and zero otherwise.  $Lossbin2_{it-1}$  equals 1 if  $ROA_{it-1}$  is between  $-0.005$  and  $-0.010$ , and zero otherwise.  $Lossbin3$ ,  $Lossbin4$ , and  $Lossbin5$  are defined similarly. Pinnuck & Lillis, 2007 demonstrate that loss firms have a lower level of incremental investment in employees than profitable firms. Labor has a fixed and variable component, so the coefficients on the small LOSSBIN can be interpreted as the incremental investment of small loss firms in fixed labor over and above the average firm. Overall, both Pinnuck and Lillis (2007) and Jung et al. (2014) argue that the investment in employees may be more sensitive in firms which have small losses. We thus include five dummies of loss bins into Eq. (1) to calculate the labor investment efficiency. For brevity, we omit similar definitions of  $Lossbin3$ ,  $Lossbin4$ , and  $Lossbin5$ . This model also includes industrial and year fixed effects. The t-statistics reported in parentheses are based on standard errors clustered at the city level.

After estimating Eq. (1), we obtain an array of coefficients and then compute the expected change in firm's labor force as the predicted value of  $NetHire$ . Thus, firm investment efficiency in labor, denoted as  $LabEff$ , is defined as the absolute magnitude of the difference between the actual change and expected change of the firm's labor force. Furthermore, a firm is categorized as over-investment in labor if the actual net hiring is above the expected net hiring; otherwise, a firm is categorized as under-investment in labor.<sup>7</sup>

### 3.2.3. Control variables

To be consistent with the strand of literatures (Pinnuck and Lillis (2007); Jung et al. (2014); Piotroski and Zhang (2014)), we introduce a number of variables to control the effect of firm characteristics on labor adjustment decisions. In particular, we control the following firm characteristics: natural logarithms of market capitalization ( $LnSize$ ), quick ratio ( $Quick$ ), dividend payout dummy ( $Divdum$ ), volatilities of cash flows from operations ( $StdCFO$ ) and sales ( $StdSales$ ), tangible asset ratio ( $Tangible$ ), loss indicator ( $Loss$ ), volatility of net hiring ( $StdNetHire$ ), labor intensity ( $LaborIntensity$ ), and leverage ratio ( $Lev$ ). The definitions of control variables are presented in Appendix A.

### 3.3. Descriptive statistics

Panel A of Table 1 presents descriptive evidence on the distribution of political promotion events on the city level across time. A number of political promotion events exhibit considerable variations over our sample period. Years 2012, 2011, and 2008 reach the top three observations, which are up to 116, 95, and 93, respectively.

We also present descriptive evidence on our key variables in Panel B. From 2002 to 2016, 19,895 firm-year observations are included in baseline regressions. The mean value of  $LabEff$ , representing firm's labor investment inefficiency, is 0.193, which is higher than its median of 0.111, indicating that more than half of the firms have higher efficiency in labor adjustment than the average level. The mean value of  $Promotion$  indicator is 0.238, suggesting that approximately 23.8% of the firm-year observations have political promotion events of either the city mayor or party committee secretary. The distributions of the control variables are generally similar to those found in previous research (e.g., Jung et al. (2014)).

## 4. Empirical results

### 4.1. Primary test

In this subsection, we set a primary test to examine the effect of impending political promotions on adjustment of local employment rate with different control variables. Since official documents and theory all point out the total employment is the concerns of local politicians, we set a regression to estimate the effect of political promotions on the growth of total employment in city. We expect political promotions will significantly increase local total employment growth, and we regress the growth of total employment

<sup>7</sup> We conjecture three reasons for firm's under-hiring decisions. First, the increasing labor costs may lead to firms not expanding the size of employees even if the firm is under-investment on labor. Second, due to the information asymmetry and market frictions in labor market, firms often cannot hire employees who are suitable for job vacancies. Last, under-hiring is calculated based on the most desirable level of firm employment derived from the economic model. However, in reality, firm managers may be ignorant about whether their labor force is below or above the most desirable level.

**Table 1**  
Summary statistics.

Panel A: Distribution of city-level political promotion by year																
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Promotion	74	56	69	38	43	76	57	93	23	36	95	116	14	69	68	8

  

Panel B: Descriptive statistics of main variables							
Variable	Obs	Mean	Median	Std. Dev	25th Percentile	75th Percentile	
LabEff	19,895	0.193	0.111	0.296	0.048	0.220	
Promotion	19,895	0.238	0	0.426	0	0	
LnSize	19,895	14.858	14.936	1.304	13.991	15.712	
Quick	19,895	0.322	0.216	0.363	0.072	0.445	
Divdum	19,895	0.614	1	0.487	0	1	
StdSales(/e+10)	19,895	0.177	0.033	1.370	0.013	0.088	
StdCFO(/e+09)	19,895	0.382	0.110	1.450	0.053	0.269	
Tangible	19,895	0.943	0.969	0.083	0.932	0.988	
Loss	19,895	0.130	0	0.336	0	0	
Std_Net_Hire	19,895	0.756	0.160	8.610	0.080	0.332	
Labor_intensity(/e-06)	19,895	1.040	0.743	1.510	0.361	1.330	
LEV	19,895	0.092	0.037	0.126	0.0004	0.138	

Note: Panel A presents the distribution of municipal political promotion events in China by year over the sample period 2001–2012. These municipal promotion events capture promotions of either the municipal party committee secretary or the municipal mayor to a position with more political power. Panel B presents the descriptive statistics of the main variables. *LabEff* is the labor investment inefficiency of each firm, which is measured as the absolute magnitude of the difference between the actual net hiring and expected net hiring in employees of firms. A larger value of *LabEff* indicates a lower efficiency in labor investment. The actual net hiring is the percentage change in the employee number of firms from year  $t-1$  to year  $t$ . The expected net hiring is estimated from Eq. (1). *Promotion* indicates the incentives of local politicians' promotion. Specifically, if a local politician get promotion between January 1 and June 30 (July 1 and December 31) in year  $t$ , then we define the prior year  $t-1$  (year  $t$ ) as the year with the highest incentives for the local politician, and *Promotion* takes the value of one. *LnSize* is natural logarithms of the market value of equity at the beginning of the year. *Quick* is the ratio of cash and short-term investments plus receivables to current liabilities at the end of the year. *Divdum* is an indicator that equals one if the firm pays dividends in the previous year, and 0 otherwise. *StdSales*, *StdCFO*, and *StdNetHire* are standard deviation of the sales, cash flows from operations, and the ratio of employee numbers to total assets from year  $t-5$  to  $t-1$ , respectively. *Tangible* is the ratio of property, plant, and equipment to total assets at the beginning of the year. *LaborIntensity* is the ratio of employee numbers to total assets at the beginning of the year. *Lev* is the ratio of long-term debts to total assets at the beginning of the year for firm  $i$  in year  $t-1$ . *Loss* is an indicator which equals one if the firm reports a loss in the previous year, and 0 otherwise.

in city on political promotion as the following model:

$$\text{EmpGrowth}_{jt} = \delta_0 + \delta_1 \text{Promotion}_{jt} + \text{Controls}_{jt} + \varphi_{jt} \quad (2)$$

where  $j$  represents a city, and  $t$  represents a year. The dependent variable is *EmpGrowth*, which is measured as the change in the local employment rate of each city from year  $t-1$  to  $t$ . *Promotion*, based on Li and Zhou (2005), is equal to one if a political promotion event occurs in year  $t$  in the city where the firm's headquarters is located, and zero otherwise. *GDP* is the natural logarithms of gross domestic product in city-level. *Urban-Index* is the proportion of permanent residents in the urban and the permanent residents in the area. The model is estimated with year fixed effect. Definitions for all variables, including variable names, are summarized in Appendix A. A positive correlation between *EmpGrowth* and *Promotion* indicates that political promotion incentive of the mayor or party committee secretary is associated with higher growth of total employment in the city.

Table 2 reports OLS estimated results. Column 1 is a result of univariate regression. Column 2 reports the results of adding control variable *GDP*, and column 3 reports the result of adding control variables *GDP* and *Urban\_Index*, respectively. The regression coefficients on *Promotion* are positively from column 1 to column 3 is consistent with our intuition that impending political promotions improve the growth of total employment in the city.

#### 4.2. Baseline results

In this subsection, we examine whether the labor investment efficiency of local firms is influenced by incentives arising from the imminent promotion of a municipal politician. Specifically, we regress the labor investment efficiency on political promotion as the following model:

$$\begin{aligned} \text{LabEff}_{it}^* = & \delta_0 + \delta_1 \text{Promotion}_{it} + \delta_2 \text{LnSize}_{it} + \delta_3 \text{Quick}_{it} \\ & + \delta_4 \text{Divdum}_{it} + \delta_5 \text{StdCFO}_{it} + \delta_6 \text{StdSales}_{it} \\ & + \delta_7 \text{Tangible}_{it} + \delta_8 \text{StdNetHire}_{it} + \delta_9 \text{LaborIntensity}_{it} \\ & + \delta_{10} \text{Lev}_{it} + \delta_{11} \text{Loss}_{it} + \varphi_{ijt} \end{aligned} \quad (3)$$



**Table 2**  
Effect of impending political promotions on local total employment rate.

Variable	$EmpGrowth_{it}$		
	(1)	(2)	(3)
$Promotion_{it}$	0.141*** (3.43)	0.141*** (3.43)	0.138*** (3.23)
$GDP_{it}$		-0.041 (-0.27)	-0.028 (-0.17)
$Urban\_Index_{it}$			-0.005 (-0.46)
Constant	-0.084 (-0.40)	0.260 (0.20)	0.516 (0.34)
Cluster	City	City	City
Fixed effects	Yes	Yes	Yes
Observations	2795	2795	2795
Adj. R <sup>2</sup>	0.016	0.016	0.014

Note: This table presents the results of the effect of impending political promotions on adjustment of local employment rate with different control variables. This panel based on OLS. In each column, the dependent variable is  $EmpGrowth_{it}$ , which is measured as the percentage change in the local employment rate of each city from year  $t-1$  to  $t$ .  $Promotion$  indicates the incentives of local politicians' promotion. Specifically, if a local politician get promotion between January 1 and June 30 (July 1 and December 31) in year  $t$ , then we define the prior year  $t-1$  (year  $t$ ) as the year with the highest incentives for the local politician, and  $Promotion$  takes the value of one. We control the following city characteristics: the natural logarithm of GDP ( $GDP_{it}$ ), and the urbanization rate (household registration caliber), the proportion of permanent residents in the urban and the permanent residents in the area ( $Urban\_Index_{it}$ ). The urban population includes the population of the urban population, the town area and the village committee (the neighborhood committee) of the municipal, and the population of the village committee connected by the road building to the town area. The permanent population is the population of the local population plus foreign population over six months and minus population who have been out for more than six months. These variables are defined in the Appendix. All models include an array of year fixed effect. The  $t$ -statistics reported in parentheses are based on standard errors clustered at the city level. Standard errors are clustered at city level. \*\*\*, \*\*, and \* denote the statistical significance of a two-tailed test at the 1%, 5%, and 10% level, respectively.

where  $i$  represents a firm,  $j$  represents a city, and  $t$  represents a year. The dependent variable is  $LabEff$  (reflecting labor investment inefficiency), which is estimated from Eq. (1).  $Promotion$ , based on Li and Zhou (2005), is equal to one if a political promotion event occurs in year  $t$  in the city where the firm's headquarters is located, and zero otherwise.  $LnSize$  is the natural logarithms of the market value of equity at the beginning of the year.  $Quick$  is the ratio of cash and short-term investments plus receivables to current liabilities at the end of the year.  $Divdum$  is an indicator that equals one if the firm pays dividends in the previous year, and zero otherwise.  $StdCFO$  is standard deviation of cash flow from operations over years  $t-5$  to  $t-1$ ;  $StdSales$  is standard deviation of sales over years  $t-5$  to  $t-1$ ; and  $Tangible$  is the ratio of property, plant, and equipment to total assets at the beginning of the year.  $StdNetHire$  is standard deviation of the percentage change in employee numbers over year  $t-5$  to  $t-1$ .  $LaborIntensity$  is the ratio of employee numbers to total assets at the beginning of the year.  $Lev$  is the ratio of long-term debts to total assets at the beginning of the year for firm  $i$  in year  $t-1$ .  $Loss$  is an indicator that equals one if the firm reports a loss in the previous year, and zero otherwise. The model is estimated with industry and year fixed effects. Definitions for all variables, including variable names, are summarized in Appendix A. The  $t$ -statistics reported in parentheses are based on standard errors clustered at the city level. A positive correlation between  $LabEff$  and  $Promotion$  indicates that the political promotion incentive of the mayor or party committee secretary is associated with higher inefficient levels of firm investment in labor.

Table 3 reports OLS estimated results. Columns 1, 2, and 3 are based on the full sample, subsample with over-investments in labor (i.e., positive abnormal net hiring), and subsample with under-investments in labor (i.e., negative abnormal net hiring), respectively.

In column 1, the estimated coefficient on  $Promotion$  is positive and significant ( $t$ -value = 3.00), which is consistent with our intuition that political promotion facilitates more inefficient net hiring. Other firm characteristics also affect firm investment efficiency in labor. Firms with larger size ( $LnSize$ ), no dividend payment ( $Divdum$ ), more labor intensity ( $LaborIntensity$ ), higher volatilities of labor adjustment ( $StdNetHire$ ), and higher long-term debt ratio ( $Lev$ ) tend to exhibit less efficient investment in labor. We then construct two subsamples based on the sign of abnormal net hiring. Over-investment in labor is defined as the positive abnormal net hiring (i.e., actual net hiring greater than the expected level), and under-investment in labor is defined as the negative abnormal net hiring (i.e., actual net hiring less than the expected level). In the regressions, we still use the absolute values as the dependent variables. Thus, a positive coefficient on  $Promotion$  for either subsample would indicate that political promotion incentives are associated with more inefficient investments in labor (larger deviation between actual and expected net hiring).

Column 2 of Table 3 focuses on over-hiring firms, and the estimated coefficient on  $Promotion$  is positive and significant, indicating that impending political promotions decrease (increase) labor investment efficiency (inefficiency). Interpreting this result is straightforward. As for the Chinese government, the most concerned issue is promoting employment (Zhou (2007)). Accordingly, the evaluation criteria for promoting local politicians clearly include employment situation (or unemployment rate), resulting in local politicians pressured to increase employment at firm level. Therefore, hiring more employees will decrease labor investment efficiency of over-hiring firms.

Column 3 of Table 3 estimates the effect of  $Promotion$  on labor investment efficiency based on under-hiring firms. Surprisingly, the

**Table 3**  
Effect of impending political promotions on labor investment efficiency.

Variable	All	Over-hiring	Under-hiring
	(1)	(2)	(3)
<i>Promotion<sub>ijt</sub></i>	0.024*** (3.00)	0.060** (2.48)	0.013*** (2.84)
<i>LnSize<sub>it</sub></i>	0.025*** (3.94)	0.054*** (2.96)	0.004 (1.12)
<i>Quick<sub>it</sub></i>	0.004 (0.23)	−0.001 (−0.02)	0.009 (0.92)
<i>Divdum<sub>it</sub></i>	−0.015 (−1.49)	−0.000 (−0.01)	−0.014** (−2.48)
<i>StdCFO<sub>it</sub></i>	−0.000 (−1.29)	−0.000 (−0.24)	0.000 (0.38)
<i>StdSales<sub>it</sub></i>	0.000 (0.02)	−0.000 (−0.85)	−0.000 (−0.96)
<i>Tangible<sub>it</sub></i>	−0.039 (−1.59)	−0.098 (−1.34)	−0.041*** (−3.17)
<i>Loss<sub>it</sub></i>	−0.000 (−0.02)	−0.068** (−1.97)	0.034*** (5.27)
<i>StdNetHire<sub>it</sub></i>	−0.018*** (−9.32)	−0.039*** (−7.64)	−0.001 (−0.99)
<i>LaborIntensity<sub>it</sub>/10<sup>6</sup></i>	0.011*** (4.54)	0.065*** (5.67)	−0.003*** (−2.71)
<i>Lev<sub>it</sub></i>	0.376*** (8.87)	0.850*** (7.18)	0.002 (0.09)
<i>Constant</i>	−0.168* (−1.71)	−0.592** (−2.09)	0.129** (2.40)
<i>Fixed effects</i>	Yes	Yes	Yes
Observations	12,514	4327	8187
Adj. R <sup>2</sup>	0.020	0.055	0.011

Note: This table presents the OLS results from estimating the effect of impending political promotions on the labor investment efficiency of firms. The dependent variables are labor investment inefficiency *LabEff*, which is defined as the absolute magnitude of the difference between the actual net hiring and expected net hiring in employees of firms. A larger value of *LabEff* indicates a lower efficiency in labor investment. Herein, the actual net hiring is the percentage change in the employee number of firms from year  $t-1$  to year  $t$ . The expected net hiring is estimated from Eq. (1). *Promotion* indicates the incentives of local politicians' promotion. Specifically, if a local politician get promotion between January 1 and June 30 (July 1 and December 31) in year  $t$ , then we define the prior year  $t-1$  (year  $t$ ) as the year with the highest incentives for the local politician, and *Promotion* takes the value of one. Column 1 reports the results for the full sample. Column 2 (3) reports the results in the subsample of over-investment (under-investment) in labor, containing observations in which actual net hiring is higher (lower) than expected net hiring at the firm-year. We control the following firm characteristics: natural logarithms of market capitalization (*LnSize*), quick ratio (*Quick*), dividend payout dummy (*Divdum*), volatilities of cash flows from operations (*StdCFO*) and sales (*StdSales*), tangible asset ratio (*Tangible*), loss indicator (*Loss*), volatility of net hiring (*StdNetHire*), labor intensity (*LaborIntensity*), and leverage ratio (*Lev*). These variables are defined in the Appendix. All firm-level control variables are measured at year  $t-1$ . All models include an array of year and industrial fixed effects. The t-statistics reported in parentheses are based on standard errors clustered at the city level. \*\*\*, \*\*, and \* denote the statistical significance of a two-tailed test at the 1%, 5%, and 10% level, respectively.

coefficient is significantly positive, which indicates that impending political promotions also decrease labor investment efficiency in under-hiring firms. To a certain extent, the results are inconsistent with our expectations. We expect that the pressures of increasing the employment level stemming from the promotion incentives of local politicians will benefit under-hiring firms, which may enhance their labor investment efficiency. A plausible explanation is that: the hiring behavior of firms due to politician interventions leads to a distortion of labor structure, which may not help under-hiring firms to reach the optimal allocation of labor force.<sup>8</sup> To further explore the underlying mechanism, we return to this issue in Section 4.4 by introducing the human capital structure at firm level.

### 4.3. Causality

#### 4.3.1. Instrumental variable estimators

In this subsection, we turn to address the endogeneity problem. To establish the causality for our basic model, one concern is the reverse causality between the labor investment efficiency and impending political promotions. In this case, our finding may reflect the association between labor investment efficiency and political promotion rather than the causal effect of incentives of promotion

<sup>8</sup> The improvement of the efficiency of labor investment is related to both the size and the structure of employees. If the impending political promotion of local officials forces the under-hiring firms to hire more employees with low levels of human capital, it is reasonable to expect that such hiring behaviors will decrease labor investment efficiency of under-hiring firms.

on labor investment efficiency.

To formally address this issue, we introduce an instrumental variable for the incentives of political promotion. A valid instrument should satisfy two conditions. The first condition is relevance, which means that the instrument is strongly correlated with incentives of political promotion. The other condition is the exclusion restriction, which indicates that the instrument should not directly affect firm investment efficiency in labor.

Specifically, we choose the death toll in mine accidents to construct the instrumental variable of promotions of local officials in addressing this problem. Chinese coal mining is regarded as the deadliest industry in the world in terms of the considerable number of death of people in coal pits every year (Jia (2017)). Its annual fatalities averaged 4634 between 2000 and 2011 and there is a close relationship between accident mortality and the local government. (Nie and Zhao (2013)). Tu (2007) reports that the number of coalmining workers killed by mining accidents in China was over 250,000 since 1949, and China accounts for approximately 80% of coalmining fatalities in the world. Jia (2017) show that the death rate was increased dramatically during the decentralized period, and the correlation between death rate and productivity is negative.

For example, on December 5, 2007, a gas explosion accident in a coal mine happened in Hongdong District of Linfen City (in Shanxi province), which caused the death of 105 miners. The mayor of Linfen City, Li Tiantai, was removed from his post in December 2007 due to the fatal accident.<sup>9</sup> On April 26, 2011, a mining accident occurred in Didao District of Jixi City (in Heilongjiang province). Nevertheless, the owner of the mine concealed the fact from the authorities. To get rid of adverse influence on political promotions, local government officials in Jixi City became reluctant to undertake detailed investigation to cover the accident at the year of political turnovers. Through comprehensive investigation of officials in the province, the accident rumor was finally confirmed with a mortality of nine miners.<sup>10</sup>

The aforementioned cases are just a microcosm of many mining accidents, which supports our argument that mining accidents have a negative effect on the promotion of local officials. In general, mining accidents have no direct influence on the labor investment efficiency of individual firms. Accordingly, we introduce a variable based on local mining accidents to represent the promotion incentive of local politicians.

We manually collect mining accident data from the government website of the State Administration of Work Safety,<sup>11</sup> which provides an accident inquiry system. The dataset contains information about the time, amount of fatalities, and economic classification of the accidents in each city. Specifically, we define  $S_{Fatal}$  as the total number of deaths of all mine accidents in each city-year. If the city has no mine fatalities in a city-year, the  $S_{Fatal}$  is 0. The incidence of extraordinarily serious accidents in mine in a city will significantly decrease the promotion possibility of local politicians, indicating that heavy mining accidents have strong and highly negative effects on political promotions of local officials.

Panel A Table 3 presents the estimated results based on instrumental variable regressions. Aside from the economic rationale, we require our instrument to pass the relevance (associated with the endogenous variable) and validity (orthogonal to the residual) conditions. First, to prove its relevance, we ensure that the coefficient for the instrument is statistically significant in first-stage regression. Second, based on the rule of thumb for strong instruments proposed by Staiger and Stock (1997), we ensure that the F-statistic associated with all of the endogenous variables is above 10 and statistically significant.

Column 1 of Table 4 reports the first-stage regression with  $S_{Fatal}$  as an instrument for *Promotion*. The coefficient of  $S_{Fatal}$  is significantly negative, which is consistent with our expectation. Meanwhile, the F-statistic in the first stage is around 30, which exceeds to 10, and significant at 0.01 level, implying that our instrument satisfies the condition of a strong instrument. The first-stage regressions in the two subsamples of over-investment in labor and under-investment in labor have the same economic significance as the full sample. Thus, we omit the results to save space.

Column 2 of Table 4 reports the second-stage results of the full sample. Consistent with the results in Table 3, the IV coefficient on *Promotion* is positive and highly significant. Column 3 of Table 4 reports the IV results for over-hiring subsample. The IV coefficient on *Promotion* is positive and significant again. Column 4 of Table 4 presents the IV results for under-hiring firms, but the IV coefficient on *Promotion* turns to be insignificant. However, this finding does not fully support the plausible argument that the incentive of political promotions enhances labor investment efficiency by increasing the employment level for under-hiring firms.

Thus far, one concern is that mining accidents may have potential effect on the mining and dredge industries. Therefore, to check the robustness, we exclude firms in mining industry (with an industry code of B under the classification of the China Securities Regulatory Commission) from our sample. The estimations with the two-stage least squares method are shown in Panel B of Table 4. Highly consistent results are documented once again.

#### 4.3.2. Placebo test

Some omitted variables may give rise to the correlation between the promotion incentives of local politicians and labor investment efficiency, which may lead to a positive relationship. Therefore, to address the concern that our results may be driven by some unobserved conditions of local economy, we conduct a placebo test by falsifying political promotion points to get pseudo political promotion incentive. Specifically, we set the false time point two years before and after the actual point of political promotions, respectively. Indicator variable  $P_{Promotion}$  equals one if the firm-year falls in the falsely specified point of political promotion, and zero otherwise. Given that a regular term of government position is five years, we believe that two-year term is a reasonable period.

<sup>9</sup> [http://www.china.com.cn/review/txt/2007-12/22/content\\_9417532.htm](http://www.china.com.cn/review/txt/2007-12/22/content_9417532.htm).

<sup>10</sup> <http://news.163.com/11/0503/14/734ug6bu00014aed.html>.

<sup>11</sup> <http://media.chinasafety.gov.cn>. <http://media.chinasafety.gov.cn:8090/iSystem/shigumain.jsp>.

**Table 4**  
Instrumental variable estimation.

Variable	First Stage	Second Stage		
	All	All	Over-hiring	Under-hiring
	(1)	(2)	(3)	(4)
Panel A: Estimation based on all listed firms				
$S\_Fatal_{it}(Instrument)$	-0.002*** (-3.04)			
$Promotion_{it}(Instrumented)$		0.425** (2.08)	0.878* (1.67)	0.127 (0.81)
$LnSize_{it}$	-0.011*** (-2.92)	0.011*** (2.92)	0.031*** (3.55)	0.002 (0.91)
$QUICK_{it}$	0.032* (1.93)	0.002 (0.32)	0.014 (0.90)	0.001 (0.16)
$Divdum_{it}$	-0.006 (-0.59)	-0.015** (-2.26)	-0.031** (-2.07)	-0.019*** (-4.41)
$Std\_CFO_{it}$	-0.000 (-1.06)	-0.000** (-2.10)	-0.000** (-2.19)	-0.000 (-0.37)
$Std\_Sales_{it}$	0.000 (0.65)	0.000 (0.82)	0.000 (1.59)	-0.000 (-1.45)
$Tangible_{it}$	0.019 (0.30)	-0.216*** (-5.16)	-0.244*** (-3.04)	-0.136*** (-4.08)
$Loss_{it}$	-0.001 (-0.05)	-0.024*** (-3.04)	-0.068*** (-3.41)	-0.002 (-0.39)
$Std\_Net\_Hire_{it}$	0.000 (0.31)	0.002*** (2.76)	0.003* (1.74)	0.001** (2.19)
$Labor\_Intensity_{it}/10^6$	-0.000 (-0.02)	0.003 (1.23)	0.013** (2.10)	-0.003 (-0.51)
$Lev_{it}$	-0.041 (-0.99)	0.145*** (5.17)	0.329*** (4.72)	0.008 (0.47)
Constant	0.408*** (4.44)	0.105 (1.14)	-0.314 (-1.27)	0.242*** (3.42)
Cluster	City	City	City	City
Fixed effects	Yes	Yes	Yes	Yes
Observations	18,280	18,280	7388	10,892
Adj. $R^2$	0.002	NA	NA	NA
Panel B: Estimation after excluding listed firms in the mining industry				
$S\_Fatal_{it}(Instrument)$	-0.002*** (-3.03)			
$Promotion_{it}(Instrumented)$		0.427** (2.08)	0.879* (1.66)	0.130 (0.82)
Cluster	City	City	City	City
Fixed effects	Yes	Yes	Yes	Yes
Observations	17,727	17,727	7142	10,585
Adj. $R^2$	0.002	NA	NA	NA

Note: This table presents the two-stage-least-squares results from estimating the effect of impending political promotions on firm investment efficiency in labor. We introduce extremely serious accidents in coal mines as an instrument of political promotions. Instrument variable  $S\_Fatal$  is the total number of deaths of all mine accidents in each city-year. If the city has no mine fatalities in a city-year, the  $S\_Fatal$  is 0. According to the regulation enacted by the State Council, an accident is identified as an extraordinarily serious one if the death toll is 30 and above. We report the results of the first and second stage. In the second stage, we conduct the analyses in the full sample, the subsample with over-investment in labor, and the subsample with under-investment in labor, respectively. Panel A reports the results based on all listed firms. Panel B reports the selected coefficients after excluding listed firms in the mining industry. In both panels, the dependent variables in the second stage are labor investment inefficiency  $LabEff$ , which is defined as the absolute magnitude of the difference between the actual net hiring and expected net hiring in employees of firms. A larger value of  $LabEff$  indicates a lower efficiency in labor investment. Herein, the actual net hiring is the percentage change in the employee number of firms from year  $t-1$  to year  $t$ . The expected net hiring is estimated from Eq. (1).  $Promotion$  indicates the incentives of local politicians' promotion. Specifically, if a local politician get promotion between January 1 and June 30 (July 1 and December 31) in year  $t$ , then we define the prior year  $t-1$  (year  $t$ ) as the year with the highest incentives for the local politician, and  $Promotion$  takes the value of one. We control the following firm characteristics: natural logarithms of market capitalization ( $LnSize$ ), quick ratio ( $Quick$ ), dividend payout dummy ( $Divdum$ ), volatilities of cash flows from operations ( $StdCFO$ ) and sales ( $StdSales$ ), tangible asset ratio ( $Tangible$ ), loss indicator ( $Loss$ ), volatility of net hiring ( $StdNetHire$ ), labor intensity ( $LaborIntensity$ ), and leverage ratio ( $Lev$ ). These variables are defined in the Appendix. All firm-level control variables are measured at year  $t-1$ . All models include an array of year and industrial fixed effects. The t-statistics reported in parentheses are based on standard errors clustered at the city level. \*\*\*, \*\*, and \* denote the statistical significance of a two-tailed test at the 1%, 5%, and 10% level, respectively.

**Table 5**  
Placebo tests.

Panel A	Two years before the actual points			Two years after the actual points		
	All	Over-hiring	Under-hiring	All	Over-hiring	Under-hiring
Variable	(1)	(2)	(3)	(4)	(5)	(6)
<i>P_Promotion<sub>it</sub></i>	0.002 (0.31)	-0.006 (-0.39)	0.003 (0.68)	0.003 (0.49)	-0.006 (-0.41)	0.007 (1.57)
<i>LnSize<sub>it</sub></i>	0.019** (2.52)	0.028 (1.63)	0.011** (2.54)	0.013* (1.78)	0.015 (0.81)	0.006 (1.36)
<i>QUICK<sub>it</sub></i>	-0.008 (-0.66)	-0.008 (-0.33)	-0.012 (-1.12)	0.002 (0.26)	-0.009 (-0.37)	0.006 (0.57)
<i>Divdum<sub>it</sub></i>	0.001 (0.18)	0.011 (0.75)	-0.002 (-0.26)	-0.008 (-0.90)	-0.009 (-0.50)	-0.002 (-0.47)
<i>Std_CFO<sub>it</sub></i>	-0.000 (-1.51)	-0.000** (-1.97)	-0.000 (-1.05)	-0.000 (-1.41)	-0.000*** (-2.77)	-0.000 (-1.14)
<i>Std_Sales<sub>it</sub></i>	0.000 (1.20)	0.000* (1.93)	0.000 (0.34)	0.000 (1.08)	0.000*** (5.04)	0.000 (0.41)
<i>Tangible<sub>it</sub></i>	-0.311*** (-4.51)	-0.526*** (-3.93)	-0.095 (-1.55)	-0.135** (-2.07)	-0.198* (-1.90)	0.007 (0.11)
<i>Loss<sub>it</sub></i>	-0.027*** (-3.92)	-0.055*** (-2.94)	-0.010 (-1.22)	-0.029*** (-4.60)	-0.056*** (-3.53)	-0.012 (-1.61)
<i>Std_Net_Hire<sub>it</sub></i>	0.002*** (2.74)	0.003 (1.49)	0.001** (2.50)	0.003** (2.59)	0.004* (1.70)	0.000 (0.21)
<i>Labor_Intensity<sub>it</sub>/10<sup>6</sup></i>	0.008** (2.54)	0.035 (1.56)	-0.001 (-0.11)	0.009** (2.52)	0.046** (2.59)	-0.000 (-0.05)
<i>Lev<sub>it</sub></i>	0.277*** (5.83)	0.560*** (6.27)	0.005 (0.17)	0.258*** (5.36)	0.581*** (6.67)	-0.003 (-0.13)
<i>Constant</i>	0.211** (2.18)	0.282 (1.26)	0.104 (1.35)	0.118 (1.01)	0.101 (0.35)	0.077 (0.90)
<i>Cluster</i>	City	City	City	City	City	City
<i>Fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Obs</i>	17,333	6929	10,380	15,631	6203	9407
<i>Adj. R<sup>2</sup></i>	0.033	0.067	0.081	0.036	0.059	0.084

Note: This table presents the results of placebo tests by falsifying political promotion points. From columns 1 to 3, the political promotion point is falsely specified at two years before the actual point. From columns 4 to 6, the political promotion point is falsely specified at two years after the actual point. We conduct the analyses in the full sample, the subsample with over-investment in labor, and the subsample with under-investment in labor, respectively. *P\_Promotion* is an indicator, which equals one if the firm-year falls in the falsely specified point of political promotion, and zero otherwise. The dependent variables are labor investment inefficiency *LabEff*, which is defined as the absolute magnitude of the difference between the actual net hiring and expected net hiring in employees of firms. A larger value of *LabEff* indicates a lower efficiency in labor investment. Herein, the actual net hiring is the percentage change in the employee number of firms from year  $t-1$  to year  $t$ . The expected net hiring is estimated from Eq. (1). We control the following firm characteristics: natural logarithms of market capitalization (*LnSize*), quick ratio (*Quick*), dividend payout dummy (*Divdum*), volatilities of cash flows from operations (*StdCFO*) and sales (*StdSales*), tangible asset ratio (*Tangible*), loss indicator (*Loss*), volatility of net hiring (*StdNetHire*), labor intensity (*LaborIntensity*), and leverage ratio (*Lev*). These variables are defined in the Appendix. All firm-level control variables are measured at year  $t-1$ . All models include an array of year and industrial fixed effects. The t-statistics reported in parentheses are based on standard errors clustered at the city level. \*\*\*, \*\*, and \* denote the statistical significance of a two-tailed test at the 1%, 5%, and 10% level, respectively.

We also find very similar results by leading or lagging three-year term as the placebo promotion year. If the decrease of labor investment efficiency results from the exact incentives of political promotion, then we should not document any significant association in the placebo test.

The placebo test results are presented in Table 5 and results are consistent with our expectation. The finding shows that, when pseudo promotion points are set either lagged behind or ahead of time for two years, the coefficients for the pseudo political promotion (*P\_Promotion*) are not significantly different from zero.

Overall, no causal effect is found between the pseudo political promotions and labor investment efficiency of firms, which further alleviates the concern that our main findings are driven by spurious correlations caused by some omitted variables that have associations with both political promotions and firms' labor investment. Accordingly, the placebo test provides supportive evidence that political promotion incentives causally reduce labor investment efficiency.

#### 4.4. Human capital misallocation

According to the results in Sections 4.3, no significant increase is found in the labor investment efficiency for under-hiring firms (in Table 3), which is further confirmed in 2SLS estimations (in Table 4). In this subsection, we explore the underlying reason the increase of employment level for under-hiring firms does not improve labor investment efficiency.

If the newly hired employees are not the type of talents that the firm mostly needs, then the increase of employee number may not

enhance labor efficiency. Accordingly, the human capital cost will substantially increase and crowd out other investments, which in turn hampers the improvement of labor investment efficiency.

Arguably, people with different educational backgrounds have different human capital. We conjecture that the promotion incentive of local politicians probably induces local firms to hire more local people to ease out unemployment rate, and this kind of new employees are more likely to be with low human capital, which is the reason they are jobless. Why? The lower the human capital, the more likely it is to be replaced. So in the competition among employees, the labor market is often left with low human capital employees. However, Heckman (2003) finds that in China, people with higher levels of education are better able to absorb new ideas, adapt to foreign technologies, improve local technologies, understand and apply knowledge from outside China to local situations. Therefore, if the hiring behavior of firms only significantly increases workers with low human capital, then it may lead to a decline in labor investment efficiency. In such case, the under-hiring firms will not benefit from the newly hired workers. Worse, these firms may pay the labor cost and may cost more to train for the new workers, which also eventually lower the labor investment efficiency. Dollar and Wei (2007) argue that factor mismatch and invalid configuration are common in developing countries. They demonstrate that, without increasing the capital input, only reducing the mismatch factor can improve the level of economic output and production efficiency.

Based on the discussions above, we examine which type of educational employees increases when local officials have political promotion incentives to provide evidence on the misallocation of the human capital structure. According to education level, we categorize firm employees into three types, which are employees with master degree or above, bachelor degree, or with degree below bachelor. In particular, we run the following regression model:

$$NetHire_{it} \text{ (or HumanCapitalGrowth}_{it}) = \delta_0 + \delta_1 Promotion_{ijt} + Controls_{it} + \varphi_{it} \quad (4)$$

where  $i$  represents a firm,  $j$  represents a city, and  $t$  represents a year. The dependent variable is the growth of firm employees with different human capital from year  $t-1$  to  $t$ . *Promotion* is defined according to Li and Zhou (2005), which is equal to one if a political promotion event occurs in year  $t$  in the city wherein the headquarters of the firm is located, and zero otherwise. *HumanCapitalGrowth* indicates the growth of specific human capital, including the percentage change in the number of firm employees with master degree or above (*MasterGrowth*), bachelor degree (*BachelorGrowth*), and degree below bachelor (*OtherGrowth*). *Controls* represent a battery of control variables, which are the same in Eq. (1), i.e., the estimation model for labor investment efficiency.

Table 6 reports the results in the full sample. The dependent variable in column 1 is *NetHire*, which is measured as the percentage change in the total number of firm employees from year  $t-1$  to  $t$ . In columns 2, 3, and 4, the dependent variables are *MasterGrowth*, *BachelorGrowth*, and *OtherGrowth*, respectively. Panel A presents the OLS estimation, which shows that firms hire more employees with degree below bachelor under the promotion pressure of local politicians. The impending political promotion of local officials forces firms to hire more employees with low levels of human capital.

When focusing on firms with under-investment in labor (negative abnormal net hiring subsample), the regression result is consistent with the full sample. Combining the results in Table 6, although we document that hiring high human capital could be beneficial to the labor investment efficiency of firms, under-hiring firms only excessively increase workers with low human capital on average. Therefore, the labor force mismatch causes the poor firm employment, which further confirms our conjecture.

We employ two-stage regression using *S\_Fatal* as the instrumental variable to address the potential endogenous issue, such as reverse causality or omitted variables. The estimated results are presented in Panel B of Table 6. Obviously, the results based on IV regression are highly consistent with the results in Panel A.

#### 4.5. Robustness checks

##### 4.5.1. Secretaries of municipal party committee and mayors

In our empirical conduction, we define *Promotion* based on the promotion of either the municipal party committee secretary or mayor. Xu, Qian, and Li (2013) treat the municipal party committee as the leader of the party and the mayor as the administrative leadership. In a few situations, the municipal party committee is more powerful. However, a number of scholars (Chen and Luo (2012)) argue that the mayor, who is appointed by the Local People's Congress, is responsible for the economy, thereby implying that he/she has great power.

Based on the preceding discussion, we introduce alternative definitions of political promotion to check the robustness of our results. Panel A of Table 7 reports the relevant results. From columns 1 to 3 (columns 4 to 6), *Promotion* is redefined as an indicator, which is equal to one if the mayor (party committee secretary) has a promotion in year  $t$  in the city wherein the headquarters of the firm is located, and zero otherwise. As expected, the promotion of either the municipal party committee secretary or mayor significantly affects labor investment efficiency, and the effect of the promotion of the municipal party committee secretary is relatively more significant.

##### 4.5.2. Excluding firms in Beijing and other provincial capitals

In practice, albeit locating headquarters in a city, firms may directly be administrated by a higher level of government, such as central government or provincial government. In such case, these firms usually obtain less political pressure from local governments at city level. Therefore, in this subsection, we exclude firms in Beijing or other provincial capitals to clearly identify the effect of political promotion incentive on the labor investment efficiency of local firms.

Panel B of Table 7 reports the result of the new sample. Columns 1, 2, and 3 present estimations using the remaining full sample, over-hiring, and under-hiring firms, respectively. Consistent with our expectation, excluding firms in Beijing and other provincial capitals, our results are still significant.

**Table 6**  
Effects of impending political promotion on firm adjustment of employees with different human capital.

Panel A: OLS				
Variable	<i>NetHire<sub>it</sub></i>	<i>MasterGrowth<sub>it</sub></i>	<i>BachelorGrowth<sub>it</sub></i>	<i>OtherGrowth<sub>it</sub></i>
	(1)	(2)	(3)	(4)
<i>Promotion<sub>it</sub></i>	0.012** (2.04)	0.254 (1.04)	0.011 (0.73)	0.092** (2.46)
<i>SALES_GROWTH<sub>it-1</sub></i>	0.028*** (3.35)	0.014 (0.35)	0.005 (0.23)	0.043 (1.16)
<i>SALES_GROWTH<sub>it</sub></i>	0.245*** (12.56)	0.071 (0.76)	0.011 (0.43)	0.030 (0.85)
$\Delta$ <i>ROA<sub>it-1</sub></i>	-0.244*** (-4.34)	0.218 (0.96)	0.248* (1.93)	-0.325 (-1.29)
$\Delta$ <i>ROA<sub>it</sub></i>	-0.518*** (-6.62)	0.799 (1.62)	0.617*** (3.00)	-0.453*** (-1.97)
<i>SIZE_R<sub>it-1</sub></i>	0.017 (1.56)	0.089 (1.07)	-0.055 (-1.27)	-0.025 (-0.91)
$\Delta$ <i>QUICK<sub>it-1</sub></i>	0.006 (0.41)	-0.034 (-0.17)	0.040 (1.27)	0.008 (0.09)
$\Delta$ <i>QUICK<sub>it</sub></i>	-0.074*** (-3.47)	0.032 (0.29)	0.044 (0.57)	-0.079 (-1.07)
<i>QUICK<sub>it-1</sub></i>	0.010 (1.39)	-0.072 (-1.29)	-0.040* (-1.69)	0.027 (0.75)
<i>LEV<sub>it-1</sub></i>	0.046 (1.59)	0.614* (1.90)	0.076 (0.99)	0.014 (0.20)
<i>LOSSBIN1<sub>it</sub></i>	-0.002 (-0.11)	-0.116 (-1.06)	-0.026 (-0.72)	0.101 (0.79)
<i>LOSSBIN2<sub>it</sub></i>	-0.003 (-0.09)	0.733 (1.09)	0.035 (0.65)	-0.063* (-1.76)
<i>LOSSBIN3<sub>it</sub></i>	-0.016 (-0.37)	-0.169* (-1.77)	-0.123*** (-4.37)	0.005 (0.11)
<i>LOSSBIN4<sub>it</sub></i>	0.017 (0.34)	0.138 (0.99)	-0.058* (-1.71)	-0.096*** (-4.04)
<i>LOSSBIN5<sub>it</sub></i>	0.005 (0.09)	-0.296*** (-3.48)	0.034 (0.35)	0.067* (1.85)
Constant	0.003 (0.09)	-0.048 (-0.20)	0.094*** (2.32)	0.146 (1.14)
Cluster	City	City	City	City
Fixed effects	Yes	Yes	Yes	Yes
Obs	19,895	11,251	17,473	17,532
Adj. R <sup>2</sup>	0.117	0.005	0.027	0.012

  

Panel B: 2SLS					
Variable	First stage	Second stage			
	<i>Promotion<sub>it</sub></i>	<i>NetHire<sub>it</sub></i>	<i>MasterGrowth<sub>it</sub></i>	<i>BachelorGrowth<sub>it</sub></i>	<i>OtherGrowth<sub>it</sub></i>
	(1)	(2)	(3)	(4)	(5)
<i>S_Fatal<sub>it</sub>(Instrument)</i>	-0.002*** (-3.81)				
<i>Promotion<sub>it</sub></i>		0.657** (2.16)	0.024 (1.32)	0.006 (0.99)	0.111* (1.67)
<i>SALES_GROWTH<sub>it-1</sub></i>	0.028*** (3.80)	0.049*** (4.05)	0.001** (2.25)	0.000 (1.27)	0.017 (0.82)
<i>SALES_GROWTH<sub>it</sub></i>	0.001 (0.11)	0.295*** (18.06)	0.006** (2.31)	0.005*** (7.56)	0.002 (0.38)
$\Delta$ <i>ROA<sub>it-1</sub></i>	-0.048 (-0.84)	0.088 (1.16)	-0.001 (-0.26)	0.002 (1.33)	0.119 (1.20)
$\Delta$ <i>ROA<sub>it</sub></i>	-0.006 (-0.11)	0.096 (1.26)	0.038 (1.37)	0.012*** (2.83)	0.087 (1.04)
<i>SIZE_R<sub>it-1</sub></i>	-0.019 (-1.03)	0.092*** (7.08)	0.000 (0.26)	0.001* (1.71)	0.013 (1.32)
$\Delta$ <i>QUICK<sub>it-1</sub></i>	-0.057*** (-3.70)	0.001 (0.06)	0.003** (2.32)	0.001 (1.37)	0.023 (1.07)
$\Delta$ <i>QUICK<sub>it</sub></i>	0.042** (2.36)	-0.103*** (-4.87)	-0.001 (-0.46)	-0.002* (-1.94)	-0.048 (-1.24)

(continued on next page)

Table 6 (continued)

Panel B: 2SLS					
Variable	First stage	Second stage			
	$Promotion_{it}$	$NetHire_{it}$	$MasterGrowth_{it}$	$BachelorGrowth_{it}$	$OtherGrowth_{it}$
	(1)	(2)	(3)	(4)	(5)
$QUICK_{it-1}$	0.075*** (4.84)	0.033*** (3.51)	-0.002* (-1.91)	-0.001*** (-2.81)	-0.009 (-1.33)
$LEV_{it-1}$	-0.011 (-0.33)	-0.405*** (-6.19)	0.005 (1.32)	-0.001 (-0.48)	-0.027 (-1.37)
$LOSSBIN1_{it}$	-0.005 (-0.12)	-0.035 (-1.01)	-0.001 (-0.74)	-0.001 (-1.59)	-0.003 (-0.51)
$LOSSBIN2_{it}$	-0.066 (-1.51)	0.004 (0.07)	-0.000 (-0.22)	-0.001 (-1.08)	-0.000 (-0.07)
$LOSSBIN3_{it}$	0.038 (0.71)	-0.025 (-0.47)	-0.002 (-1.10)	-0.002* (-1.95)	-0.005 (-0.65)
$LOSSBIN4_{it}$	-0.050 (-1.10)	-0.037 (-0.62)	0.001 (0.47)	-0.001 (-0.52)	0.001 (0.23)
$LOSSBIN5_{it}$	-0.098** (-2.31)	0.018 (0.28)	-0.001 (-0.15)	0.004 (1.08)	0.014 (1.46)
Constant	0.235*** (19.99)	-0.403*** (-3.52)	0.005 (1.50)	-0.001 (-0.49)	0.036 (0.49)
Cluster	City	City	City	City	City
Fixed effects	Yes	Yes	Yes	Yes	Yes
Obs	18,138	18,138	11,220	17,067	17,452
Adj. R <sup>2</sup>	0.003	NA	NA	NA	NA

Note: This table presents the results of the effect of impending political promotions on firm adjustment of employees with different human capital. Panels A and B are based on OLS and 2SLS, respectively. In each Panel, the dependent variable in column 1 is  $NetHire$ , which is measured as the percentage change in the number of firm employees from year  $t-1$  to  $t$ . From column 2 to 4, the dependent variables are  $MasterGrowth$ ,  $BachelorGrowth$ , and  $OtherGrowth$ , respectively.  $MasterGrowth$  ( $BachelorGrowth$ ,  $OtherGrowth$ ) is the percentage change in the number of firm employees with master degree or above (bachelor degree, degree below bachelor) from year  $t-1$  to  $t$ .  $Promotion$  indicates the incentives of local politicians' promotion. Specifically, if a local politician get promotion between January 1 and June 30 (July 1 and December 31) in year  $t$ , then we define the prior year  $t-1$  (year  $t$ ) as the year with the highest incentives for the local politician, and  $Promotion$  takes the value of one. Instrument variable  $S\_Fatal$  is the total number of deaths of all mine accidents in each city-year. If the city has no mine fatalities in a city-year, the  $S\_Fatal$  is 0. According to the regulation enacted by the State Council, an accident is identified as an extraordinarily serious one if the death toll is 30 and above. We control the following firm characteristics: the sales growth at year  $t-1$  and  $t$  ( $SalesGrowth_{it-1}$ ,  $SalesGrowth_{it}$ ), the change of ROA at year  $t-1$  and  $t$  ( $\Delta ROA_{it-1}$ ,  $\Delta ROA_{it}$ ), the rank of market capitalization ( $SizeR_{it-1}$ ), the quick ratio at year  $t-1$  ( $Quick_{it-1}$ ), the change of quick ratio at year  $t$  and  $t-1$  ( $\Delta Quick_{it-1}$ ,  $\Delta Quick_{it}$ ), the leverage ratio at year  $t-1$  ( $Lev_{it-1}$ ), and five indicators of  $Lossbin$  ( $Lossbin1/2/3/4/5$ ). These variables are defined in the Appendix. All firm-level control variables are measured at year  $t-1$ . All models include an array of year and industrial fixed effects. The t-statistics reported in parentheses are based on standard errors clustered at the city level. \*\*\*, \*\*, and \* denote the statistical significance of a two-tailed test at the 1%, 5%, and 10% level, respectively.

## 5. Further evidence

In this section, we conduct three cross-sectional tests by determining the conditions in which the effect of political promotion incentive on labor investment efficiency is more significant.

### 5.1. State-owned firms versus non-state-owned firms

Fisman (2001) argues that when social-political influence is relatively large, firms endeavor to establish a political connection to weaken the strong conflict with government officials and maximize the political gains. Piotroski and Wong (2012) indicate that one important institutional feature of the Chinese economy is that a considerable number of firms are owned by the government, such as SOEs. For example, as of July 2010, the state owns an average of 53% of the outstanding shares of listed firms, and the remaining 47% belonged to individuals, institutional investors, investment trusts, and private firms.

Fan, Wong, and Zhang (2007) and Liao, Liu, and Wang (2014) indicate that during the process of government decentralization reform, governments significantly influence the appointments and dismissals of executives of state-owned firms. Therefore, executives of state-owned firms usually volunteer to fulfill the policy objectives of the government, such as providing more employment opportunities, to obtain a better promotion opportunity. However, Piotroski & Zhang, 2014 state that the relationship between non-state-owned firms and local governments are often more insidious. If so, the effect of the impending political promotion both on state-owned firms and non-state-owned firms are significant.

Panel A of Table 8 shows the regression results. All results are consistent with our expectation and the significance of impending political promotion on both state-owned firms and non-state-owned firms are high.



Table 7

Robustness checks: different measures and subsamples.

Panel A: Alternative definition of promotion						
Variable	Municipal Mayor			Municipal Party Committee Secretary		
	All	Over-hiring	Under-hiring	All	Over-hiring	Under-hiring
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Promotion<sub>it</sub></i>	0.014** (2.15)	0.024* (1.66)	0.009** (2.01)	0.014** (2.01)	0.026* (1.85)	0.013*** (2.64)
<i>Control variables</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Cluster</i>	City	City	City	City	City	City
<i>Fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
Obs	17,644	7123	10,521	16,334	6936	9398
Adj. <i>R</i> <sup>2</sup>	0.022	0.074	0.034	0.022	0.028	0.037

  

Panel B: Excluding observations in Beijing and other provincial capitals			
Variable	All	Over-hiring	Under-hiring
	(1)	(2)	(3)
<i>Promotion<sub>it</sub></i>	0.015** (2.43)	0.024* (1.69)	0.016*** (2.76)
<i>Control variables</i>	Yes	Yes	Yes
<i>Cluster</i>	City	City	City
<i>Fixed effects</i>	Yes	Yes	Yes
Obs	13,520	5430	8090
Adj. <i>R</i> <sup>2</sup>	0.018	0.051	0.009

Note: This table presents the robustness of baseline regression with different measures and subsamples. Panel A introduces an alternative definition of political promotion. From column 1 to 3 (column 4 to 6), *Promotion* is defined based on promotion of municipal mayor (municipal party committee secretary). Specifically, if a local politician get promotion between January 1 and June 30 (July 1 and December 31) in year  $t$ , then we define the prior year  $t-1$  (year  $t$ ) as the year with the highest incentives for the local politician, and *Promotion* takes the value of one. Panel B excludes firms whose headquarters are located in the city of Beijing or other provincial capitals. In each Panel, we conduct the analyses based on full sample, the subsample with over-investment in labor, and the subsample with under-investment in labor, respectively. The dependent variables are labor investment inefficiency *LabEff*, which is defined as the absolute magnitude of the difference between the actual net hiring and expected net hiring in employees of firms. A larger value of *LabEff* indicates a lower efficiency in labor investment. Herein, the actual net hiring is the percentage change in the employee number of firms from year  $t-1$  to year  $t$ . The expected net hiring is estimated from Eq. (1). We control the following firm characteristics: natural logarithms of market capitalization (*LnSize*), quick ratio (*Quick*), dividend payout dummy (*Divdum*), volatilities of cash flows from operations (*StdCFO*) and sales (*StdSales*), tangible asset ratio (*Tangible*), loss indicator (*Loss*), volatility of net hiring (*StdNetHire*), labor intensity (*LaborIntensity*), and leverage ratio (*Lev*). These variables are defined in the Appendix. All firm-level control variables are measured at year  $t-1$ . All models include an array of year and industrial fixed effects. The t-statistics reported in parentheses are based on standard errors clustered at the city level. \*\*\*, \*\*, and \* denote the statistical significance of a two-tailed test at the 1%, 5%, and 10% level, respectively.

## 5.2. National Congress of the Communist Party of China

In this part, we explore the effect of *Promotion* on labor investment efficiency during the period with and without NCCPC. The NCCPC is the most anticipated, and carefully prepared political event in China (Piotroski and Zhang (2014)), which appoints the leadership of the communist party and the central government, determines the political goals and economic policies. Therefore, the NCCPC can be seen as an expected political event. In our sample period, the NCCPC occurred in 2002, 2007 and 2012.

Panel B of Table 8 reports the relevant results. We partition the sample according to the presence or absence of political promotion during the NCCPC. From columns 1 to 3, we include observations regarding the presence or absence of promotion of local officials during the NCCPC. From columns 4 to 6, we include observations regarding the presence or absence of promotion in years of local officials without NCCPC. We find that the effect of the political promotion of local officials on the labor investment efficiency of firms is higher during the period of NCCPC than that during the periods without NCCPC; however, the difference is obvious. Considering that political promotions during the NCCPC are more paid. Thus, officials who promoted during NCCPC period have more motivation to show their accomplishments.

## 5.3. Promotions before expiration of term

In this subsection, we investigate the difference between political promotions before the expiration of the term and regular promotions. According to “Organization Law of the Local People's Congresses and Local People's Governments of the People's Republic of China” (Article 58, Chapter 4), the term of officials in various governments of local people is five years. Therefore, we

**Table 8**  
Cross-sectional tests.

Panel A: State-owned firms and non-state-owned firms						
Variable	State-owned firms			Non-state-owned firms		
	All	Over-hiring	Under-hiring	All	Over-hiring	Under-hiring
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Promotion<sub>it</sub></i>	0.013** (2.22)	0.028** (2.23)	0.012*** (2.65)	0.015* (1.92)	0.033* (1.76)	0.014** (2.15)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	City	City	City	City	City	City
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs	11,688	4657	7031	7547	3141	4406
Adj. R <sup>2</sup>	0.015	0.036	0.012	0.054	0.030	0.092

  

Panel B: The National Congress of the Communist Party of China						
Variable	Periods with NCCPC			Periods without NCCPC		
	All	Over-hiring	Under-hiring	All	Over-hiring	Under-hiring
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Promotion<sub>it</sub></i>	0.059*** (6.68)	0.114*** (4.15)	0.047*** (5.68)	0.009* (1.87)	0.017* (1.74)	0.017* (1.74)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	City	City	City	City	City	City
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs	16,540	6639	9901	18,564	7808	10,756
Adj. R <sup>2</sup>	0.016	0.042	0.011	0.046	0.080	0.060

  

Panel C: Non-expire promotion and expire promotion						
Variable	Promotion before the expiration of the term			Regular promotion		
	All	Over-hiring	Under-hiring	All	Over-hiring	Under-hiring
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Promotion<sub>it</sub></i>	0.012** (2.16)	0.018* (1.66)	0.011** (2.50)	0.022** (2.07)	0.045* (1.74)	0.015** (2.11)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	City	City	City	City	City	City
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs	18,946	7691	11,255	16,115	6496	9519
Adj. R <sup>2</sup>	0.012	0.011	0.088	0.023	0.038	0.037

Note: This table presents the results of cross-sectional tests. Panel A examines whether the baseline results are affected by property rights of enterprises. From column 1 to 3, we include firms owned by the local or central governments. From column 4 to 6, we include firms owned by neither the local nor central governments. Panel B examines the impact of *Promotion* on labor investment efficiency during the period of National Congress of the Communist Party of China (NCCPC) and the period without NCCPC. From column 1 to 3, we include observations where local officials have promotion during the NCCPC and observations where no local officials have promotion. From column 4 to 6, we include observations where local officials have promotion in years without the NCCPC and observations where no local officials have promotion. Panel C examines the difference between political promotions before the expiration of the term and regular promotions. From column 1 to 3, we include observations where local officials have promotion before the expiration of the term and observations where no local officials have promotion. From column 4 to 6, we include observations where local officials have regular promotion and observations where no local officials have promotion. In each Panel, we conduct the analyses in the remaining full sample, the subsample with over-investment in labor, and the subsample with under-investment in labor, respectively. The dependent variables are labor investment inefficiency *LabEff*, which is defined as the absolute magnitude of the difference between the actual net hiring and expected net hiring in employees of firms. A larger value of *LabEff* indicates a lower efficiency in labor investment. Herein, the actual net hiring is the percentage change in the employee number of firms from year  $t-1$  to year  $t$ . The expected net hiring is estimated from Eq. (1). *Promotion* indicates the incentives of local politicians' promotion. Specifically, if a local politician get promotion between January 1 and June 30 (July 1 and December 31) in year  $t$ , then we define the prior year  $t-1$  (year  $t$ ) as the year with the highest incentives for the local politician, and *Promotion* takes the value of one. We control the following firm characteristics: natural logarithms of market capitalization (*LnSize*), quick ratio (*Quick*), dividend payout dummy (*Divdum*), volatilities of cash flows from operations (*StdCFO*) and sales (*StdSales*), tangible asset ratio (*Tangible*), loss indicator (*Loss*), volatility of net hiring (*StdNetHire*), labor intensity (*LaborIntensity*), and leverage ratio (*Lev*). These variables are defined in the Appendix. All firm-level control variables are measured at year  $t-1$ . All models include an array of year and industrial fixed effects. The t-statistics reported in parentheses are based on standard errors clustered at the city level. \*\*\*, \*\*, and \* denote the statistical significance of a two-tailed test at the 1%, 5%, and 10% level, respectively.

divide the political promotion samples into promotions before the expiration of the term and regular promotions. In particular, we classify a promotion as one before the expiration of the term when a politician with a tenure period of less than 5, 10, or 15 years gets promoted. Intuitively, regular promotions appear more likely to be expected, and politicians may exhibit significant efforts to obtain a smooth promotion when their term expires. With regard to promotions before the expiration of a term, the promotion may be rather unexpected and politicians have relatively low incentives to intervene in the local labor market. Simultaneously, having enough time to exert/transfer political pressure on local firms is relatively difficult for local politicians.

We examine whether the effects of promotion incentive of local officials on the labor investment efficiency of local firms are greater for regular promotions. Panel C of Table 8 presents the results. From columns 1 to 3, we include observations regarding the presence or absence of promotion of local officials before the expiration of the term. From columns 4 to 6, we include observations regarding the presence or absence of regular promotion of local officials. The results indicate that the influence of regular promotion on the labor investment efficiency of firms is higher than that of promotions before the expiration of the term.

## 6. Conclusions

Focusing on human capital misallocation, this study examines the effect of political promotion incentives on labor investment efficiency at firm level. The empirical results show that the incentive accompanying the political promotion of local politicians significantly decreases the labor investment efficiency of local firms. The observed relationship remains in over-hiring and under-hiring firms. We prove that the promotion incentive of local politicians indeed enhances the number of firm employees, especially those with low human capital, which causes the failure of local firms in reaching the optimal allocation of the labor force. Further evidence suggests that the distortion of labor structure conditional on political promotion does not benefit either over-hiring or under-hiring firms in labor investment efficiency. Through instrument variable based on fatal accidents in the coal mine and placebo tests, we document consistent results after identifying the causality and controlling omitted variables. Cross-sectional tests show that the effect of political promotion incentive on labor investment efficiency is more pronounced for stated-owned firms, regular promotions, promotions during the periods of NCCPC, and politicians with high education level. Overall, this study identifies the mechanism behind the change of labor investment efficiency of Chinese firms from a political economy perspective.

## Appendix A. Variable definitions

Variable	Definition
<i>Promotion</i>	An indicator variable equal to one if a political promotion event occurs in year $t$ in the city wherein the headquarters of firm $i$ is located, and zero otherwise.
<i>EmpGrowth</i>	Percentage change in the local employment rate of each city from year $t-1$ to $t$ for city $j$ .
<i>NetHire</i>	Percentage change in the number of employees from year $t-1$ to $t$ for firm $i$ .
<i>LabEff</i>	The absolute magnitude of the difference between the actual net hiring and expected net hiring in employees of the firm. Herein, the actual net hiring is measured by <i>NetHire</i> . The expected net hiring is estimated from Eq. (1). A larger value of <i>LabEff</i> indicates a lower efficiency in labor investment.
<i>ROA</i>	Return on assets, measured as net income scaled by total assets at the beginning of the year for firm $i$ .
<i>LnSize</i>	Natural logarithms of market capitalization at the beginning of the year for firm $i$ .
<i>MasterGrowth</i>	Percentage change in the number of employees with master or above degrees from year $t-1$ to year $t$ for firm $i$ .
<i>BachelorGrowth</i>	Percentage change in the number of employees with bachelor degrees from year $t-1$ to $t$ for firm $i$ .
<i>OtherGrowth</i>	Percentage change in the number of employees with degrees below bachelor from year $t-1$ to $t$ for firm $i$ .
<i>SalesGrowth</i>	Percentage change in sales from year $t-1$ to $t$ for firm $i$ .
<i>SizeR</i>	Percentile rank of market capitalization in year $t$ for firm $i$ .
<i>Quick</i>	Quick ratio, measured as cash and short-term investments plus receivables scaled by current liabilities in year $t$ for firm $i$ .
<i>LossbinX</i>	Five separate loss bins indicate each 0.005 interval of <i>ROA</i> from 0 to $-0.025$ in year $t-1$ for firm $i$ . For example, <i>Lossbin1</i> equals one if <i>ROA</i> ranges from $-0.005$ to 0, and zero otherwise. <i>Lossbin2</i> equals one if <i>ROA</i> is between $-0.005$ and $-0.010$ , and zero otherwise. <i>Lossbin3</i> , <i>Lossbin4</i> , and <i>Lossbin5</i> are similarly defined.
<i>Lev</i>	Leverage ratio, measured as long-term debts scaled by total assets at the beginning of the year for firm $i$ .
<i>StdCFO</i>	Standard deviation of the cash flows of firm $i$ from operations from year $t-5$ to $t-1$ .
<i>StdSales</i>	Standard deviation of the sales of firm $i$ from year $t-5$ to $t-1$ .
<i>StdNetHire</i>	Standard deviation of the percentage change of firm $i$ in the number of employees from year $t-5$ to $t-1$ .
<i>Divdum</i>	An indicator variable which is equal to one if firm $i$ paid dividends in year $t-1$ and zero otherwise.
<i>Tangible</i>	Book value of property, plant, and equipment at the end of year $t-1$ , divided by total assets in year $t-1$ for firm $i$ .
<i>LaborIntensity</i>	Labor intensity, measured as the number of employees divided by total assets at the end of year $t-1$ for firm $i$ .
<i>Loss</i>	An indicator variable equals one if firm $i$ has negative <i>ROA</i> in year $t-1$ .
<i>GDP</i>	The natural logarithm of gross domestic product in city $j$ of year $t$ .
<i>Urban_Index</i>	

The proportion of permanent residents in the urban and the permanent residents in the city  $j$  of year  $t$ . (The urban population includes the population of the urban population, the town area and the village committee (the neighborhood committee) of the municipal, and the population of the village committee connected by the road building to the town area. The permanent population is the population of the local population plus foreign population over six months and minus population who have been out for more than six months.)

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