The Matching of Heterogeneous Firms and Politicians

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Abstract

We use a Chinese firm-director level panel dataset to examine the matching of heterogeneous firms and politicians. Based on 36,308 detailed biographies, we identify individuals that previously held bureaucratic positions and classify the rank of each position in the Chinese political hierarchy. Using this direct measure of political capital, we examine how firms with heterogeneous productivity match with politicians with different political strength. Our results indicate a positive assortative matching in the political markets. More productive firms recruit more powerful politicians. Further, the preference for political capital relative to conventional human capital increases in firms' dependence on external financing and decreases in the efficiency of local governments. Conditional on the endogenous matching, new hires with greater political strength receive more compensation than their co-workers in the same cohort. The marginal effect of a one-step rise in the political ladder exceeds the marginal effect of raising education attainment from, for example, high school to college.

Key words: firm heterogeneity, politician, political hierarchy, matching
JEL codes: D21, D73, J24, J31, O12

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1 Introduction

The soaring of China's economy in the past decades has drawn increasing attention to its political system. In contrast to its unprecedented economic growth, China's political liberalization is far less profound. The highly closed political regime continues to rule while the country embraces economic integration. This discrepancy grants new economic values to political capital as rent-seeking activities move from an autarkic environment to a fast-growing open economy.

A large number of studies have shown that political connections play an important role in firms' economic performance around the world.[1] Existing evidence suggests that political connections help firms secure favorable regulatory conditions, gain access to resources, and receive preferential treatment in legal system. These "benefits" are not exclusive to one nation. They have been identified in both developed and developing countries, including the United States, Brazil, Malaysia, India, Indonesia, Pakistan, and China.

In this paper, we take a step back from the conventional focus on evaluating the ex-post effect of political connections and examine instead the endogenous decision of firms to invest in political capital. We investigate how the differential decisions of firms to engage in political investment lead to an *assortative matching* between firms with heterogeneous physical productivity and politicians with heterogeneous ability. Our analysis contributes to the existing literature by addressing the assignment in political markets, an issue that has received little attention in the past, and comparing that with the assignment in traditional labor markets. Taking into account this endogenous assignment, we identify the price of political capital relative to conventional human capital and evaluate the magnitude of political premium.

Understanding the matching of firms and political capital is important for a number of reasons. First, it helps establish the causal effect of political connections on firm performance. When there is a systematic relationship between firm productivity and the decision to build political connections, estimating the effect of political connections without taking into account the above relationship is likely to bias the result. Second, a rapidly expanding literature in international economics, led by Melitz (2003), Bernard and Jensen (1999), Helpman *et al.* (2004) and Eaton *et al.* (2008), has noted that firm heterogeneity plays an important role in explaining firms' entry and exit decision in domestic and international markets. Our analysis, by introducing additional dimensions of heterogeneity in factor markets, complements the above literature and helps identify potential sources of firm heterogeneity. Finally, whether there is positive or negative assortative matching conveys broad implications for the efficiency of matching and, moreover, firm dispersion. Dependent on the direction of assortative matching, political investment can either widen or contract firm divergence in performance.

The institutional environment of China provides a natural context for studying the matching of firms and political capital. First, unlike democratic economies where campaign contributions

[1] We discuss the literature in greater detail below.

serve as a main channel to invest in politics,[2] business entities in China rely on building personal connections (known as *"guanxi"*) with governments. Hiring former politicians with attractive political background is an approach that has often been adopted (Li, 1998). Second, unlike bribery—an alternative channel of political investment, recruiting politicians is legitimate under the rule of law. This means that it is possible to systematically quantify the latter type of interaction between firms and politicians. Third, the Chinese political system features a clear political hierarchy where the political power of each level of politicians is strictly ordinal. This gives us an objective measure of each politician's political strength — and subsequently ability to contribute to each firm through his/her political background. Given these characteristics, examining the politician employment of Chinese firms offers us a unique channel to study the matching in political markets.

We use a Chinese firm-director level panel dataset to undertake the tasks.[3] The dataset reports a detailed biography for each individual (in total 36,308 individuals and 89,608 observations). The biography describes in detail each person's education level and previous work experience. We examine each biography and identify all the political positions previously held by each individual. We then match each position to the Chinese political hierarchy (Section 3) and classify its corresponding rank.[4] Our statistics show that more than 35 percent of the non-state controlled companies have politicians in their director team. These politicians differ considerably in the rank of their political positions. As of 2007, 73 percent of them were former officials of local city governments whereas 19 percent held the positions of provincial governor or the equivalent.

The dataset exhibits several features that are essential for studying political-market matching. First, as mentioned above the data allows us to treat political capital as a heterogeneous factor. Instead of using an indicator variable as in many earlier contributions (such as communist party membership in Li *et al.*, 2008), we differentiate the rank of political positions held by each individual. We also control for the scope of each person's political connections using the number of previously held political jobs. These variables give us alternative measures of political strength that varies across individuals. Second, the data permits us to account for conventional human capital. It reports the education level and professional qualification of each individual. This information allows us to examine firms' preference between political and conventional human capital and compare the matching with politicians to the matching with traditional labor. It also helps address the potential correlation between political accomplishment and education/professional attainment and estimate the relative price of political capital.

[2] See Stratmann (2005) for a review of studies on political campaigns.

[3] The data includes the population of Chinese publicly listed companies in the period of 2004-2007 with the exclusion of enterprises whose corporate governance is subject to government intervention. See Section 5 for more details of the data.

[4] There were two challenges in constructing the data. First, the original biography information was presented in a descriptive format. This required extracting each individual's previous positions manually from the text. Second, mapping each position to the political hierarchy was a complex process given the vast Chinese political system.

Finally, the panel nature of the data is useful for establishing the causality between firm productivity and matching decision. We identify the new hires of each company in each year and examine how firms' physical productivity and performance in a lagged period affect their future matches with politicians. The firm-director structure of data also makes it possible to evaluate the price premium of political capital within each firm with the use of firm-year fixed effect and isolate the effect of unobserved factors.

We proceed by first considering a simple matching model as a guide to the empirical analysis. We build on the vast literature of matching theory led by Roy (1950) and Tinbergen (1951) and explore how the matching theory, traditionally applied to labor and marriage markets, can help explain the assignment between firms and politicians. We consider a continuum of firms, each characterized by a distinct "physical" productivity (determined by, e.g., the efficiency of physical capital), and two types of human capital, both heterogeneous in ability. The first type consists of a continuum of conventional labor and the other a continuum of politicians. Politicians differ in their political strength and thus the ability to contribute to each firm through their political background, knowledge and network. We assume that firm physical productivity and the two types of human capital abilities are complementary in production.

The model yields three intuitive hypotheses. First is what we label as the *positive assortative matching* hypothesis, which predicts that more productive firms will be matched with more capable human capital, including both conventional labor and politicians. The second hypothesis concerns the *ability ratio* of political and conventional human capital. The ratio is predicted to increase in firm productivity when the politician markets are less dispersed than the conventional labor markets and in the relative importance of political capital ability in production function. Finally, we obtain a *pay ratio* hypothesis: the pay ratio of politicians relative to conventional labor is higher when the relative importance of political capital is larger.

The empirical evidence is broadly consistent with these predictions. We find that more productive firms are significantly more likely to have politically endowed individuals on board than their less efficient competitors. They also tend to match with politicians from the higher levels of hierarchy, as expected from the first hypothesis. While a similar matching also applies to conventional human capital ability, more productive firms exhibit a stronger preference for capable politicians as opposed to capable non-political labor. This is especially true when firms are dependent on external financing, suggesting that the importance of political capital increases in firms' reliance on credit access. The preference for politicians is also stronger when firms are located in cities with lower government efficiency where the value of political capital is likely greater. Controlling for endogenous matching and individual characteristics such as education and professional qualification, directors with political endowment receive significantly more compensation than their co-workers, as expected from the pay ratio hypothesis. The political premium increases in the level of political rank and is greater in industries and locations where political capital exerts a larger value. A one-step rise in the political ladder from municipal

to provincial level leads to 12 percent more pay. Conventional human capital, on the other hand, appears to affect the compensation of existing directors mainly.

We argue that our results offer evidence of positive assortative matching where a match is mutually beneficial to firms and politicians rather than alternative explanations such as extortion by politicians. The latter interpretation would assume that firms do not derive any benefits from political connections and the match is determined alone by politicians' self imposition. This interpretation is unlikely given the institutional environment in China where the direct influence of government officials on non-state controlled businesses has diminished substantially in the past decades. It is also inconsistent with our finding that firms with greater potential demand for political capital (because of, e.g., larger financial constraints) have a stronger preference for politicians. This finding would not arise if firms would not derive any value from political capital and it is only politicians that extract rents from the most profitable firms.

The assortative matching remains robust when we address the potential endogeneity of productivity using an instrumental variable (IV) approach in which the average productivities of upstream and downstream firms located in the same province are employed as identifying instruments. The choice of these two IVs is motivated by the growing literature on productivity spillover between vertically linked industries. We construct the variables based on a large population of public and private firms to mitigate sample selection.[5] Our results indicate that correcting for the potential endogeneity of firm efficiency does not change the positive matching between productive firms and capable politicians.

Our paper is closely related to the growing literature that examines the effect of political connections on firm performance. Empirical evidence in this literature shows that political connections help firms secure favorable regulatory conditions (Agrawal and Knoeber, 2001) and obtain preferential access to resources such as bank loans (Khwaja and Mian, 2005; Claessens et al., 2008). It also suggests that political connections can help raise the market value of firms (Roberts, 1990; Fisman, 2001; Ramalho, 2007) and improve their economic performance (Johnson and Mitton, 2003). These results are not exclusive to one nation; they have been identified in both industrial and emerging economies including the U.S. (Snyder, 1990; Agrawal and Knoeber, 2001), Brazil (Ramalho, 2007; Claessens *et al.*, 2008), Indonesia (Fisman, 2001), Malaysia (Johnson and Mitton, 2003) and Pakistan (Khwaja and Mian, 2005). Faccio (2005) provides a unique cross-country comparison of politically connected firms. Several studies provide related evidence based on Chinese firm-level data.[6] Li *et al.* (2008), for example, investigate the relationship between communist party membership and profitability of Chinese private firms. They find that being affiliated to the communist party has a positive effect on firms' access to bank loans and confidence in the legal system, the former of which is similarly shown in Bai *et al.*

[5] Note the director information is not available for private firms, which dictated the use of public firms in the main analysis.

[6] Haggard and Huang (2008) provide an excellent survey on the political economy of private-sector development in China.

(2005).[7] Du and Girma (2007) examine the effect of political affiliation on firms' survival and growth prospects. Their results indicate a robust positive relationship. This paper differs from these studies by examining the endogenous decision of firms to invest in political capital. Instead of treating firms' political connections as an exogenous endowment, we examine how firms with heterogeneous productivity and other characteristics such as external finance dependence vary in their political investment decisions.

The rest of the paper is organized as follows. In section 2, we discuss China's economic and bureaucratic reforms during the transition period and how they affect the interaction between economy and bureaucracy. We then describe in Section 3 the structure of political hierarchy in China. In section 4, we build a simple matching model as a prelude to the empirical analysis and derive three main hypotheses. We describe the data and variable construction in Section 5. In Section 6, we estimate the matching mechanism underlying firms and politicians. In Section 7, we examine the price of political capital in comparison to conventional human capital. The paper concludes in section 8.

2 The Interaction of Economy and Bureaucracy in China

In the past three decades, China undertook a dramatic transition from a planned economy to a market-oriented economy. At the same time as this transition, several major reforms were implemented in the bureaucratic system. These economic and bureaucratic transitions have transformed the political incentives of Chinese firms and the economic incentives of Chinese politicians. In this section, we provide a brief overview of the transformations.

2.1 The economic transition

At the outset of China's reforms in 1978, the state controlled virtually all aspects of the economy. Since that time, China initiated a long sequence of economic restructuring by granting market forces a central role in determining the prices of goods, services and factors. This process is marked by two interrelated phenomena: the sharp decline of state-owned enterprises (SOEs) and the explosion of privately-controlled industrial activities.

As China started introducing market reforms, SOEs that were historically dependent on government protection and subsidies faced the dual challenge of increasing market competition and decreasing fiscal support. Enterprises that had been idle before the reforms were quickly crowded out of the markets. According to the Chinese Industry Census data, the output share of state-owned enterprises plunged from 81 percent in 1980 to 15 percent in 2005. The number

[7] While most existing studies find political connections have a positive effect on firm performance, there is also evidence of negative influence. Fan et al. (2007), for example, show that politically connected CEOs can have an adverse impact on the post-IPO performance of newly privatized Chinese state-owned enterprises. The rationale there is that during the early privatization process political connections represent government intervention whose interests often differ from asset value and profit maximization.

of SOEs dropped by more than 90%. The remaining enterprises were forced to undertake drastic restructuring including a partial privatization process initiated in 1993 when the Company Law was adopted. This process greatly diversified the corporate ownership of SOEs and transformed the role of government to the role of a shareholder.[8] The process did not, however, eliminate government intervention in the remaining state-controlled firms. For example, the hiring decision of top executives in these firms continues to be partially or even completely interfered by the government.[9]

Given the primary interest of this paper is to examine the endogenous matching between firms and politicians, we exclude enterprises whose shareholders include government entities at either central or local level. We focus instead on companies that are under little direct government influence and enjoy autonomy in their corporate governance. These include largely privatized former SOEs and privately owned businesses — a group that experienced a remarkable growth in the economic transition.

The 2005 Census data shows that 85 percent of industrial output came from non-state-owned firms and firms with partial or full foreign ownership. This figure represents a substantial increase in the weight of private sectors compared to 1980 when non-state-controlled activities constituted 20 percent of the entire economy. Another indicator is the growth of investment by private businesses: As of 2003 more than 60 percent of fixed-asset investment was initiated by non-state-owned firms (Haggard and Huang, 2008). These firms also play an increasingly important role in China's participation in international markets, contributing to the country's rapid growth in trade and foreign investments.

However, all these transitions started in an environment where most important elements characterizing a sound institutional infrastructure, e.g., well-structured legal system, rigorous law enforcement, clearly-defined property rights, well-functioning financial markets, were still missing. The institutional constraints pose a direct impact on individual companies' performance and, consequently, corporate decisions targeted to improve firms' relative competitiveness. For example, many studies such as Perkins and Rawski (2008) point out that the private sector in China faces severe challenges in the financing of capital formation. According to a cross-country survey collected by Batra et al. (2002), the financial constraints facing Chinese entrepreneurs are similar to those prevailing in other transitional economies such as Croatia, Czech Republic and Romania and in poor economies such as Ghana and Ethiopia. Bank loans,

[8] State-owned Assets Supervision and Administration Commission (SASAC) was established in 2003 to carry out the government's functions as investor and owner of state assets. The main responsibilities of SASAC include approving mergers and acquisitions, authorizing sale of stocks and assets, and appointing top executives. As of April 2009, SASAC of the State Council oversees 138 centrally controlled state enterprises, including China's large petroleum, petrochemical, electricity, automobile, and telecom enterprises. This number steadily decreased compared to 2003 as a result of a state-pushed drive to restructure and streamline the group (China Daily, July 21 2007).

[9] There is however survey data such as the Shanghai Stock Exchange poll indicating a growing tendency of state-owned enterprises to pursue commercial interests and increasing autonomy given to SOE managers. This is attributed partly to the profit-seeking focus of SASAC and the continuing offering of public shares.

share offerings, and bond issues continue to flow mainly to state-controlled entities. This offers a strong incentive for firms to form ties with government. As described in the introduction, existing evidence (e.g., Bai et al., 2005; Li et al., 2008) show that political connections can help firms secure access to bank loans and obtain favorable loan terms. One effective channel to form political connections in China is to recruit politicians.

Raising external capital is not the only way politicians can contribute. Most firm operations involving government licensing such as real estate development, raw material procurement, government contract, and export/import can potentially benefit from political connections (Dickson, 2003). In addition to the above, politicians can also improve efficiency in dealing with government agencies and offer their regulatory and bureaucratic knowledge. We discuss next how the bureaucratic reforms in the past thirty years provided an opportunity for a growing interaction between businesses and government officials.

2.2 The bureaucratic reforms

Despite the lack of political liberalization, China has gone through a major transformation of its bureaucratic system. This transformation started in 1980 and consisted of three major reforms: the initiation of a mandatory retirement program, the granting of permission to bureaucrats to quit government positions and join businesses, and the decentralization of administrative responsibilities (Li, 1998).

The first reform addressed the promotion and retirement policy of bureaucrats. It was initiated by Deng Xiaoping in 1980 and aimed to "abolish the de facto lifetime tenure system of government officials". The reform introduced strict retirement ages for government officials and initiated a massive mandatory retirement program. It also offered a one-time buyout strategy to compensate outgoing officials both economically and politically. As expected, this reform significantly decreased the average retirement age and tenure of bureaucrats. According to the Chronicle of Contemporary Chinese Politics (1996), the average retirement age fell from 62 to 55 for provincial governors, from 64 to 58 for ministers, and from 58 to 50 for city mayors.[10] The average tenure per position decreased from 6.4 to 3.8 at the provincial governor level and from 6.6 to 4.4 at the minister level.

The second major reform is closely related to the first and was introduced in the mid-1980s when bureaucrats were allowed to quit their government positions and join businesses, a phenomenon later known as *xiahai* ("leaping into the sea"). This was accompanied by the government's substantial efforts to downsize its agencies. Both of these measures, along with the mandatory retirement and buyout program, led to a large supply of former government officials who are motivated to join the business community to pursue higher economic returns. This was documented in a 1995 survey of local government officials (State Commission of System

[10] The mandatory retirement age is 65 for provincial governors and ministers, 60 for city mayors or department chiefs, and 55 for county sheriffs and division chiefs.

Reform, 1996): close to 20 percent of interviewed officials were planning on *xiahai*. Of those, 35 percent were looking for joint-venture enterprises, 21 percent for private enterprises, and 15 percent for SOEs. A large number of bureaucrats also sought to found their own businesses and become private entrepreneurs.

The third reform is the administrative decentralization initiated in the mid 1980s. During the decentralization, considerable power and autonomy, including the authority to appoint subordinate government officials and to set economic regulations, was granted to local (provincial and municipal) governments. According to Naughton (2008), local authorities in China today enjoy more autonomy than their counterparts in some former socialist countries (for example, the Soviet Union) or even democracies (for instance, India). Prominent examples include Guangdong and Zhejiang, two coastal provinces where officials have a large scope of discretion in setting economic policies. This gave businesses increasing incentives to build connections with local politicians. These politicians contribute their institutional knowledge, political background and network. In return, they become shareholders and managers.

3 An Overview of the Political Hierarchy

Before presenting our theoretical and econometric analysis, we discuss in this section the structure of Chinese political hierarchy. The political system in China features a strictly ordinal power structure. Politicians from a higher level of the political hierarchy oversee and possess more bureaucratic power than their subordinates. Once we classify the rank of each politician in the hierarchy it will be relatively straightforward to quantify the politician's relative political strength. In this section, we describe in detail the organizational structure of Chinese political system (Table A.1 presents a summary). We start with the central government and then move to local governments.

3.1 Central government

The central government at the national level is composed of the National People's Congress (NPC), President, the Central Military Commission, and the State Council. The National People's Congress is the highest state legislative body under the Constitution of the People's Republic of China. At the annual plenary sessions, delegates review and approve new policies, laws and other important legislative and personnel changes proposed by the Communist Party of China or the State Council. Delegates of the NPC are elected from military and provincial People's Congresses, which are in turn elected from lower level congresses. The Chairman of the NPC Standing Committee is the top legislator in China and conventionally ranked third among top leaders, after the General Party Secretary and the President.

The President of China is elected by the NPC. Based upon the decisions made by the NPC and its standing committee, the President announces new laws, personnel changes and other

important political decisions.

The Central Military Commission leads the entire armed force in China. It includes the Chairman, Vice-Chairmen and several members (two Vice-Chairmen and eight members as of year 2008). The Chairman is elected by the NPC. The other members are nominated by the Chairman and approved by the NPC and its standing committee.

The State Council is the highest executive body of state power and highest administrative body of state. The State Council includes the Premier, vice-Premiers, State Councilors, and ministers of ministries and commissions. The Premier is nominated by the President and approved by the NPC. The other members of the State Council are nominated by Premier and reviewed by the NPC or its standing committee. There are 27 ministries and commissions in the State Council (e.g. Ministry of Foreign Affairs). Under the ministries and commissions, there are 22 administrations and bureaus such as National Bureau of Energy and State Food and Drug Administration.

3.2 Local governments

Local governments in China can be ranked at four levels. They include, from high to low, province, prefecture or municipality, county and township.[11] The higher-level government oversees and has administrative responsibilities over the lower-level governments. There are two top officials at each local level government. One is the Party Secretary who represents the Communist Party of China and is in charge of policy making. This figure is appointed by the superiors. The other is the head of the local government (governor, mayor or magistrate for different levels) who engages in policy making and is, in theory, elected by the people. The governments in China have a dual position system, which means that any higher level government has corresponding positions for the lower level government. Hence, a provincial government is composed of several departments and each of these departments is ranked the same as the lower level government, i.e. the municipal government.

Provinces are the highest level of local governments. As of today, excluding Taiwan, Hong Kong and Macau, China has 31 provincial units — 4 centrally administrated cities (Beijing, Shanghai, Tianjing and Chongqing), 22 provinces and 5 autonomous regions. A province ranks at the same level as a ministry in the central government. There are three level of cities in China, namely municipalities, prefecture-level cities, and county-level cities. Sub-provincial cities are prefecture-level, and sub-prefecture-level cities are county-level. By the end of 2005, China had more than 660 cities. Counties are found in the third level of the local governments, whose number is more than 1400. Township is the lowest level of local government and exists in smaller rural areas.

[11] There are four municipalities, Beijing, Tianjin, Shanghai and Chongqing, that are treated and ranked the same as provinces.

3.3 The hierarchy of Chinese politicians

Following the hierarchy of central and local governments, government officials are ranked at four levels in China. Generally speaking, officials of a higher-level government are ranked higher in the political hierarchy and have more political power than those at the lower levels.

Except the central party and state leaders at the national level, i.e., President, Premier and other top leaders, the highest ranked political position is "Bu". Provincial leaders (i.e., the provincial party secretary and governor) and ministers of State Council ministries and commissions are ranked at this level. The next rank is "Ting", which includes municipal-level positions (such as mayors) and department heads of government bureaus.[12] The third rank is "Chu" and includes county-level positions and directors of government divisions. The lowest rank is "Ke"; government officials at township level and section chiefs of government bureaus are at this level. In the Chinese political system, officials at the rank of "Bu" or "Ting" are considered as high-level officials.

In 1984, China replaced the two-rank down system with a one-rank down system as part of the decentralization. This means that, for example, the Central Committee only managed directly leaders at ministerial and provincial level. The decentralization greatly reduced the number of cadres directly managed by the Central Committee and enabled provincial leaders to gain almost complete control over appointments and dismissals of officials within their territorial jurisdiction. As a result of the 1984 reform, local governments, especially at the provincial level, revolved from an agent of the central government to governments with considerable resources and autonomy.

4 Theoretical Framework

As a prelude to the empirical investigation, we employ a simple matching model in this section to offer intuition to the sorting mechanism between firms and politicians. We build on the vast literature of matching theory led by Roy (1950) and Tinbergen (1951) and explore in this paper how the matching theory, traditionally applied to labor markets, marriage markets, local public finance and organization design, can also help explain the assignment in political markets.[13]

4.1 Basic setup

The economy consists of two sectors, one of which produces a homogeneous product and the other differentiated products. Consumers have a CES sub-utility function for the differentiated

[12] In some highly ranked municipalities, e.g., Nanjing, mayor tends to be ranked half a rank above his/her counterparts of other municipalities and the same as deputy minister.

[13] Given the main focus of this paper on the sorting of firms and politicians, we adopt a frictionless matching framework and abstract from some of the more complex features of matching models such as search cost and moral hazard problem in producing the match output. See Legros and Newman (2002) for theoretical work in this area.

good given by

$$U = \left[\int_{i \in \Omega} q(i)^{\alpha} di \right]^{\frac{1}{\alpha}}, \quad 0 < \alpha < 1 \tag{1}$$

where $q(i)$ represents the consumption quantity of variety i, Ω the set of varieties available and α the elasticity of substitution between varieties. Given this utility function, the equilibrium revenue of a firm is

$$r(i) = p(i)q(i) = Aq(i)^{\alpha}, \tag{2}$$

where $p(i)$ is the price of the variety i, $A \equiv \left[E / \int_{i \in \Omega} p(i)^{-\alpha/(1-\alpha)} di\right]^{1-\alpha}$, and E is the country's total spending on the differentiated product.

There is a continuum of firms in the differentiated product sector. Each firm draws a distinct "physical" productivity θ, representing, for example, the efficiency of physical capital and the level of endowed technology, from a distribution function $F(\theta)$. Following Melitz (2003), we assume θ follows a Pareto distribution, i.e., $F(\theta) = 1 - (\underline{\theta}/\theta)^z$ where $\theta \geqslant \underline{\theta} > 0$ and $z > 1$. From now onwards we suppress i and use θ to index firms.

There are two types of human capital; one consists of a continuum of "conventional" labor (denoted as l) and the other a continuum of politicians (denoted as g). Both types of human capital are heterogeneous in ability, which we denote as a_l and a_g respectively. Specifically, we define the political ability a_g as a representation of the strength of political connections, the level of regulatory knowledge and the access to government resources.[14] The distribution functions of the two types of human capital abilities are given by $H_l(a_l) = 1 - (\underline{a}_l/a_l)^{k_l}$ and $H_g(a_g) = 1 - (\underline{a}_g/a_g)^{k_g}$ where $a_l \geqslant \underline{a}_l > 1$, $a_g \geqslant \underline{a}_g > 1$, and $k_l, k_g > 1$.[15]

Each firm employs a unit of human capital from either the conventional labor market or the politician market or both. We assume that output of each firm (y) depends on the physical productivity of the firm (θ), the conventional human capital ability (a_l), and the political capital ability (a_g):

$$y = \theta a_l a_g^{\beta} \tag{3}$$

where $\beta > 0$ represents the marginal rate of technical substitution between political and conventional labor ability when $a_l = a_g$, and can vary, for example, across industries. This production technology assumes that there exists complementarity between firm physical productivity and human capital abilities. Put differently, the marginal benefit of labor abilities, including both a_l and a_g, increases in firm physical efficiency and vice versa.[16]

[14] Alternatively, we can interpret a_l and a_g as two characteristics of labor. Each unit of labor draws a conventional human capital ability from the distribution function $H_l(a_l)$ and a political ability from $H_g(a_g)$. The two characteristics are independent of each other as consistent with the evidence reported in Table A.3 of Section 5.

[15] The assumption of Pareto distribution is plausible for the politician market given the structure of Chinese political hierarchy. There are more than 1,400 counties in China, over 600 cities and 31 provincial units. This means that the number of politicians decreases exponentially as the political rank rises.

[16] An alternative assumption is that there exists a substituting relationship between firm efficiency and labor abilities. This would reverse the matching mechanism we identify below. We present here the case of com-

Finally, we use $w_l(a_l)$ and $w_g(a_g)$ to denote the pay rates offered by the firm to conventional labor and politicians, respectively. We assume that the pay is commensurate with the ability levels of the individuals in the following functional forms: $w_l(a_l) \equiv \gamma_l a_l^{\delta_l}/\delta_l$ and $w_g(a_g) \equiv \gamma_g a_g^{\delta_g}/\delta_g$ where $\gamma_l, \gamma_g > 0$ and $\delta_l, \delta_g \geqslant 1$.

4.2 Competitive matching

Given $w_l(a_l)$ and $w_l(a_l)$, the profit maximization problem of each firm can be written as:

$$\pi(\theta) = \max_{a_l, a_g} \{r(\theta) - w_l(a_l) - w_g(a_g)\}, \tag{4}$$

where $r(\theta) = A(\theta a_l a_g^{\beta})^{\alpha}$. The first-order conditions for the two human capital abilities are:

$$\begin{aligned} \left[\frac{\alpha}{\gamma_l} r(\theta)\right]^{1/\delta_l} &= a_l(\theta) \\ \left[\frac{\alpha\beta}{\gamma_g} r(\theta)\right]^{1/\delta_g} &= a_g(\theta). \end{aligned} \tag{5}$$

These conditions imply that firms with a larger revenue are matched with more capable conventional labor and politicians.

Using the first-order conditions, we can solve explicitly for human capital abilities as a function of firm physical productivity. This yields:

$$\begin{aligned} a_l(\theta) &= \left(\frac{\alpha A \theta^{\alpha}}{\gamma_l}\right)^{\delta_g/\varepsilon} \left(\frac{\beta\gamma_l}{\gamma_g}\right)^{\alpha\beta/\varepsilon} \\ a_g(\theta) &= \left(\frac{\alpha A \theta^{\alpha}}{\gamma_l}\right)^{\delta_l/\varepsilon} \left(\frac{\beta\gamma_l}{\gamma_g}\right)^{(\delta_l-\alpha)/\varepsilon} \end{aligned} \tag{6}$$

where $\varepsilon \equiv \delta_l\delta_g - \alpha(\delta_l\beta + \delta_g)$.[17]

4.3 Human capital market clearing

To complete the discussion, we discuss in this sub-section the pay rate functions, i.e., $w_l(a_l)$ and $w_g(a_g)$, characterized at the human capital market equilibrium. For the human capital market to clear at each ability level, we need, for any θ, that the number of firms with productivity higher than θ equals the amount of labor allocated to these firms:

$$\int_{\theta}^{\infty} dF(v) = \int_{a_l(\theta)}^{\infty} dH_l(v) \quad \text{and} \quad \int_{\theta}^{\infty} dF(v) = \int_{a_g(\theta)}^{\infty} dH_g(v). \tag{7}$$

plementarity since its corresponding sorting hypothesis is the sorting mechanism supported by the empirical evidence.

[17] Section 4.3 indicates that $\varepsilon > 0$.

Given equations (6), the above conditions imply that

$$\begin{aligned} \delta_l &= \alpha\left(1+\tfrac{k_l}{z}+\beta\tfrac{k_l}{k_g}\right) \qquad & \gamma_l &= \alpha A\left(\underline{\theta}\ \underline{a}_l^{\beta/k_l-k_l/z}\right)^{\alpha} \\ \delta_g &= \tfrac{\alpha k_g}{k_l}\left(1+\tfrac{k_l}{z}+\beta\tfrac{k_l}{k_g}\right) \qquad & \gamma_g &= \alpha\beta A\left(\tfrac{\underline{a}_g}{\underline{a}_l}\right)^{\delta_l/k_l}\left(\underline{\theta}\ \underline{a}_l^{\beta/k_l-k_l/z}\right)^{\alpha}. \end{aligned} \tag{8}$$

4.4 Hypotheses

Now we outline the main hypotheses for the empirical analysis. Inspecting equations (6) leads to the first hypothesis:

Hypothesis 1 (Positive Assortative Matching): There exists a *positive assortative matching* between firm physical efficiency θ and labor abilities a_l and a_g.

In other words, high-productivity firms are matched with high-ability conventional labor and politicians. This prediction is a direct result of complementarity between firm physical efficiency and human capital ability, also known as the "supermodularity" condition in the matching literature. The literature has noted supermodularity as a sufficient condition for positive assortative matching.

Given equations (6), we can also obtain the ratio of political and conventional labor abilities:

$$\frac{a_g(\theta)}{a_l(\theta)} = \left(\frac{\alpha A\theta^{\alpha}}{\gamma_l}\right)^{(\delta_l-\delta_g)/\varepsilon}\left(\frac{\beta\gamma_l}{\gamma_g}\right)^{(\delta_l-\alpha-\alpha\beta)/\varepsilon}, \tag{9}$$

where the market-clearing δ_l, δ_g, γ_l and γ_g are given in (8). This gives us our next hypothesis:

Hypothesis 2 (Ability Ratio): The ability ratio $a_g(\theta)/a_l(\theta)$ increases in θ when $k_g < k_l$ and β.

This hypothesis suggests that when the conventional labor market is more dispersed than the politician market, more productive firms not only are matched with more capable politicians but also exhibit a stronger relative preference for political ability. The latter is also true when β, which captures the relative importance of political capital ability, is larger.

Now consider the pay ratio of politicians relative to conventional labor. Given equations (6), this ratio can be expressed as:

$$\frac{w_g(\theta)}{w_l(\theta)} = \frac{\beta\delta_l}{\delta_g}, \tag{10}$$

where the market-clearing δ_l and δ_g are given in (8). This leads to our third hypothesis:

Hypothesis 3 (Pay Ratio): The pay ratio of politicians relative to conventional labor $w_g(\theta)/w_l(\theta)$ increases in β and exceeds 1 when $\beta > k_g/k_l$.

This prediction suggests that a greater relative importance of political capital leads to a relatively greater pay to political capital.

Finally, we briefly discuss the cutoff productivities of successful matches. This will help explain the empirical observation that while nearly all firms have some level of conventional human capital, only a fraction of them (35 percent in our data) is matched with politicians. Let $\underline{\theta}_l$ and $\underline{\theta}_g$ denote, respectively, the productivities of firms matched with the minimum human capital abilities $\underline{a}_l$ and $\underline{a}_g$. We have $\underline{\theta}_l = a_l^{-1}(\underline{a}_l)$ and $\underline{\theta}_g = a_g^{-1}(\underline{a}_g)$, where $a_l(.)$ and $a_l(.)$ are defined in equations (6). Comparing $\underline{\theta}_l$ and $\underline{\theta}_g$ suggests that when $\gamma_g \underline{a}_g^{\delta_g} > \beta\gamma_l \underline{a}_l^{\delta_l}$, firms will be sorted to three groups. Firms with $\theta < \underline{\theta}_l$ will not be matched with any human capital. Firms with $\underline{\theta}_l < \theta < \underline{\theta}_g$ are matched with one unit of conventional labor whose ability exceeds $\underline{a}_l$ but are not assigned to any politicians. Firms for which $\theta > \underline{\theta}_g$ are matched with both a unit of conventional labor and a unit of politician.

4.5 Discussion

Finally, we make two additional remarks about our results. While we do not intend to exploit these remarks empirically in the paper, we believe they convey noteworthy implications. First, we note that, given the setting of the model, the positive assortative matching derived above is also the efficient matching that maximizes the total output of all matches. This is a direct application of Koopmans and Beckmann's (1957) theorem of equivalence between the efficient matching, which maximizes the sum of output among all feasible pairwise matches, and the competitive equilibrium matching, which obtains when each firm takes as given wage rate schedules and choose the labor abilities that maximize its output. That said, one should, however, note that competitive matching can be inefficient in the presence of frictions in the matching market (see, Legros and Newman, 2002). Furthermore, the matching of firms and political capital can result in social costs such as distortion in labor's incentive to raise conventional human capital ability.

The second notable implication of our results concerns firm performance. While the assignment between firms and human capital is predicted to improve individual firms' performance, it raises the dispersion of firm performance. This can be seen by considering the distribution function of $r(\theta)$. With random matching between θ and labor abilities, the dispersion rate of $r(\theta)$ is αz where z is the shape parameter of firm productivity distribution. With the positive assortative matching, the dispersion rate of $r(\theta)$ rises to $[1+\alpha(\delta_g+\beta\delta_l)/\varepsilon]\alpha z$. The least efficient firms can eventually be forced to exit reducing the degree of competition.

5 Data and Variable Construction

We use a Chinese firm-director level panel dataset to examine the theoretical hypotheses in Section 4. The data includes all the public companies incorporated in the People's Republic

of China. Because state- and privately-controlled companies are still distinctive in corporate governance and the extent of government intervention (Section 2.1), we focus on firms that do not have any government entity ownership. We obtain each firm's ownership information from the China Stock Market & Accounting Research (CSMAR) database. This helps us examine the hiring decision in a profit-seeking environment and ensure that the estimated relationship between firm productivity and political ability reflects an outcome jointly determined by the producer and political labor markets, rather than a selection by the government. There are approximately 1200 firms in the data during the period of 2004-2007. The dataset consists of two parts. We discuss each part in great detail below and describe how we construct the main variables.

5.1 Director heterogeneity

The first part of the dataset is structured at firm-director-year level.[18] The data reports the name, detailed biography, education, starting date and compensation of all the executives and board members associated with the publicly listed companies between 2004 and 2007.[19] The filing of these information is required by China Securities Regulatory Commission (CSRC) and is supplied by CSMAR.

There are in total 36,308 individuals and 89,608 observations in the data. For each individual, the data reports a detailed biography. The biography is organized in the format required by the CSRC and describes each individual's education level, previous work experience, and previous government positions. We carefully examined each biography and identified all the political positions previously held by each individual. For each identified position, we classify the rank of the position in Chinese political hierarchy (see Table A.1). A position is ranked as 3 if it is at the level of "Bu". This includes provincial Party Secretaries, governors as well as ministers of State Council ministries and commissions. We rank a position as 2 if it is at the level of "Ting", which includes municipal-level positions (such as mayors) and department heads of government bureaus. The lowest rank that is taken into account is "Chu" and takes the value of 1. It includes county-level positions and directors of government divisions.[20] We also considered alternative weighting schemes, such as including only the highest ranks and allowing for a nonlinear effect, and found the results largely similar.

As described in Section 1, the number and composition of participating politicians varies

[18] We use the term director loosely in the paper and refer to both executives and board members. We considered distinguishing the two by taking into account only executives or board members. The results were qualitatively similar. In Section 7 where we examine the compensation, we focus exclusively on executives.

[19] The monetary compensation reported in the data is the sum of salary and bonuses. In addition to monetary compensation, the data also reports the number of shares owned by each director. There are, however, many missing values in this information, which leads us to focus on the former in the empirical analysis.

[20] We focus on bureaucratic ranks at or above "Chu" and do not take into account officials ranked at "Ke" (i.e., section chief of government bureau, township party secretary and magistrate). "Ke" is the lowest level of political hierarchy and considered to have the minimum power. Classifying this rank also requires considerable judgement.

over time. Table A.2 shows that the number of politicians engaging in the private sector in our data was 878 in 2004. The figure decreased to 660 in 2005 but increased to 793 in 2007. Within the pool of politicians, there is an increasing trend in the political power. Approximately 13 percent of participating politicians in 2004 was at the level of "Bu" (the top tier of hierarchy); this group increased to 19 percent in 2007.

In addition to the level of political positions, we identified the number of political positions held by each individual and computed the average rank of the positions. We use these two as alternative measures of political strength. As shown in Table A.3, there is a large positive correlation between the level of political rank and the number of previous positions. Individuals with a higher political rank tend to have held a larger number of positions. This is consistent with the political system in China, where officials generally start at lower levels and are gradually promoted based on their political performance.

To measure conventional human capital, we take into account each individual's education and professional qualification. We measure education based on the highest degree earned. This variable ranges from 1 to 5, with the values corresponding to, from low to high, no high school degree, high school, college, master's and doctoral degree.[21] The data shows there is little correlation between education and political endowment (Table A.3). Among all the employed directors, people with stronger political capital do not appear to have received more education. In addition to education, we also observe each person's professional credentials and titles. A variety of common credentials and titles is considered, including, for example, Certified Public Accountant (CPA), Chartered Financial Analyst (CFA), Economist and Engineer.[22] We use a dummy variable to represent these professional qualifications. Table 1 summarizes the descriptive statistics of all the director-level variables.

Finally, we take advantage of the panel nature of the data and separately identify new and existing hires in each company and each year. This information helps us establish the causal effect of firms' performance in a lagged period on their hiring decisions. The data records significant turnovers. The average number of newly hired directors is around 6.8. More than 20 percent of the companies have recruited at least one politician between 2005 and 2007.

Now we construct the dependent variable of the matching equation — the political ability matched to each firm (a_g). Specifically, we assume that $a_g = \exp(s_g)$ where s_g is a discrete variable representing the political strength of directors and consists of five alternative measures. The most basic is an indicator that equals 1 if the firm recruited at least one former politician and 0 otherwise. Alternatively, we count the number of politicians recruited by each firm. We also construct three measures to take into account politicians' differential political strength. The first is the average highest political rank held by directors. The second is the average number

[21] There are some missing values in the education variable. This led to a smaller number of observations whenever education was included in the estimation.

[22] Professional credentials and titles are extremely popular in the Chinese labor market and often viewed as requisite for obtaining professional positions and promotion.

of political positions, which we use to measure the scope of political connections. The last is the average rank of previous positions. We essentially assume that the political ability matched to each firm increases exponentially with its directors' average political rank and scope.[23] To capture firms' preference for conventional human capital, we obtain the average education and professional qualification of directors and denote them as s_l. Similarly, we assume $a_l = \exp(s_l)$.

5.2 Firm heterogeneity

The second part of the dataset includes the financial, location and ownership information of each firm. The financial section of the data is obtained from COMPUSTAT[24] and company annual reports and covers the period of 2003-2007.[25] It includes information such as sales, employment, investment, and capital stock.[26]

We estimate firm productivity based on these information. A two-step semiparametric procedure is adopted. First, we use the methodology outlined in Olley and Pakes (1996) and estimate each firm's total factor productivity (denoted as $\widehat{\delta}_{it}$). This measures each firm's overall efficiency, which, according to our model, consists of two components: the ability of existing directors (a_l and a_g) and the firm's physical efficiency (θ). In the second stage, we use $\widehat{\delta}_{it}$ and information of $a_{l,it}$ and $a_{g,it}$ to retrieve estimates of θ_{it}. This way we isolate the effect of past recruitment on future hiring decision and focus on the role of firm physical efficiency in matching. To do so, we regress estimates of TFP, i.e., $\ln \widehat{\delta}_{it}$, on $\ln a_{l,it}$ and $\ln a_{g,it}$ and consider:[27]

$$\ln \widehat{\delta}_{it} = \phi_0 + \phi_1 \ln a_{l,it} + \phi_2 \ln a_{g,it} + \varepsilon_{it}. \tag{11}$$

The residuals of the above equation, ε_{it}, measure the part of TFP that is not explained by the ability of current directors, but rather the quality of physical capital (e.g., machinery and technology), intermediate inputs, and etc., and thus serve as a proxy for $\ln \theta_{it}$. However, since $a_{l,it}$ and $a_{g,it}$ are decisions made based on firm efficiency, the simple OLS parameters will not be consistent. We thus invoke the method considered in Olley and Pakes (1996) and assume that ε_{it} follows a first-order Markov process and that $a_{l,it}$ and $a_{g,it}$ do not immediately respond to the innovation in productivity over last period's expectation, i.e., $\varepsilon_{it} - E[\varepsilon_{it}|\varepsilon_{it-1}]$. This allows us to consistently estimate the parameters of $\ln a_{l,it}$ and $\ln a_{g,it}$ by regressing $\ln \widehat{\delta}_i$ on $\ln a_{l,it}$ and $\ln a_{g,it}$ and a consistent estimate of ε_{it}:

$$\ln \widehat{\delta}_{it} = \phi_0 + \phi_1 \ln a_{l,it} + \phi_2 \ln a_{g,it} + E[\varepsilon_{it}|\varepsilon_{it-1}] + \eta_{it}. \tag{12}$$

[23] We also considered alternative functional forms and found the results largely robust.

[24] COMPUSTAT is a global database of financial and market information on publicly listed companies. It covers approximately 98% of the world's market capitalization.

[25] Financial data earlier than 2003 contain many missing values, especially for employment.

[26] Empolyment data in the COMPUSTAT is largely missing for Chinese firms. We manually collected these data from published annal reports. The final sample of firms is determined by the availability of the data.

[27] We also included city-year and industry fixed effect to control for the effect of geographic and sectoral factors.

From the above regression, we obtain $\ln \widehat{\theta}_{it} = \ln \widehat{\delta}_{it} - \widehat{\phi}_1 \ln a_{l,it} - \widehat{\phi}_2 \ln a_{g,it}$ which we use in the empirical analysis to examine the role of firm physical productivity in future matching with politicians.[28] A two-year time lag is included between firm efficiency and hiring decisions.[29]

6 The Matching of Heterogeneous Firms, Human Capital and Politicians

Now we turn to the empirical analysis. We proceed by first examining the positive assortative matching and the ability ratio hypotheses, i.e., hypotheses 1-2. We consider the prediction on pay ratio in Section 7. Specifically, we take natural logs of equations (6) and obtain the following first empirical specification:

$$\begin{aligned} \ln a_g(\theta) &= \lambda_{0g} + \lambda_{1g} \ln \theta \\ \ln a_l(\theta) &= \lambda_{0l} + \lambda_{1l} \ln \theta, \end{aligned} \tag{13}$$

where $\ln a_g(\theta) = s_g(\theta)$ and $\ln a_l(\theta) = s_l(\theta)$ measure the political and conventional human capital abilities matched to each firm, λ_{0g}, λ_{1g}, λ_{0l} and λ_{1l}, summarize all the other parameters of equations (6), such as α, β, A, δ_n and δ_g, and are controlled for with a series of fixed effects, e.g., city-year and industry (at SIC 3 digit level) dummies.[30] Hypothesis 1 predicts that $\lambda_{1g} > 0$ and $\lambda_{1l} > 0$. Alternatively, we substitute firm revenue $r(\theta)$ for firm efficiency θ as equations (5) predict a similar sorting between firm size and labor abilities.

We then investigate the second hypothesis of Section 4, which predicts the ability ratio $a_g(\theta)/a_l(\theta)$ to increase in θ when $\delta_g < \delta_l$ and in β. Since the effect of β will be likely controlled for by the fixed effects, we interact firm efficiency with proxies of β when that is the case and consider the following specification obtained by taking natural logs of equation (9):

$$\ln \frac{a_g(\theta)}{a_l(\theta)} = \lambda_{0gl} + \lambda_{1gl} \ln \theta + \lambda_{2gl} \ln \beta \cdot \ln \theta. \tag{14}$$

Hypothesis 2 predicts that $\lambda_{1gl} + \lambda_{2gl} \ln \beta > 0$ if $\delta_g < \delta_l$ and $\lambda_{2gl} > 0$.

[28] We also considered alternative measures of productivity such as a simple labor productivity and the market share of each firm. The results were qualitatively similar.

[29] The length of the time lag is determined by the availability of financial data. While the time lag mitigates the concern of potential endogeneity, we further address the issue in Section 6.4 using an instrumental variable (IV) approach.

[30] In Section 7 where we examine individual compensation, we include a firm-year fixed effect to control for all time-variant firm characteristics and rely on only within-firm variation to explain the effect of political ability on director pay. Ideally, we would also like to adopt a firm fixed effect (instead of industry dummies) in Section 6. However, given the relative infrequency of director hiring, firm dummies would substantially reduce the degrees of freedom.

6.1 The *positive assortative matching* hypothesis

Table 3 reports the estimation results of specification (13) using the total stock of directors. As described in Section 5, we consider five measures of political capital, ranging from the basic dummy and count variables to measures that take into account the heterogeneous strength of politicians. We find significant evidence of positive assortative matching between firm physical efficiency and director political strength. First, there is a positive and statistically significant relationship between firm productivity and the probability of having politicians on board. Column (1) of Table 3 indicates that a 100-percent increase in productivity is associated with 28 percentage points increase in the likelihood of employing a politician.[31] The ability of politicians is also stronger in more productive firms as suggested by columns (3)-(5). The average rank of directors is 0.65 higher in firms with twice the productivity.

Table 3 also indicates positive assortative matching between firm productivity and conventional human capital ability. More productive firms tend to have directors with higher education and professional qualification.

[Table 3 about here]

Next, instead of looking at the stock of directors we examine the inflow of political and conventional human capital by considering only new hires. This helps address the possibility of reverse causality between firm productivity and director abilities. Table 4 reports the estimates. The dependent variables are constructed using newly hired directors only.[32] Again, we find significant evidence of positive assortative matching for politicians. More productive firms are significantly more likely to recruit politically endowed individuals than their less efficient counterparts. They also tend to be matched with politicians from the higher level of hierarchy and those that held a larger number of positions. The average political rank of new directors increases by a half rank when firm productivity rises by 100 percent. New hires recruited by the top 90th percentile firms are on average ranked at the level of "Chu" (the equivalent of county magistrates), nearly twice as much as those in the bottom 10th percentile. The above positive matching similarly applies to the directors' professional qualification. Firms with a higher productivity have a significantly stronger preference for individuals with professional credentials. However, the relationship between firm productivity and director education level becomes insignificant.

[Table 4 about here]

In Table 5, we examine the matching between firm revenue and director abilities. As expected from Section 4, we find firms with a larger revenue are matched with higher political

[31] The results in column (1) are obtained based on a linear probability (LP) model. We use LP models to avoid the incidental parameter problem that would arise in fixed-effect maximum-likelihood estimators. Recall two sets of fixed effects are employed in our estimations to control for the effect of unobserved characteristics.

[32] Firms that did not have any new hires are not included in the analysis.

ability. Directors recruited by the larger companies are not only more powerful in terms of bureaucratic rank but also more experienced in terms of the number of held positions. Similar to Table 4, there is a positive correlation between firm revenue and new hires' professional qualification even though the correlation with education remains insignificant.

[Tables 5 about here]

6.2 The *ability ratio* hypothesis

Now we proceed to the second hypothesis of Section 4 and examine whether more productive firms exhibit a higher political to conventional labor ability ratio, especially when the relative importance of political capital captured in β is high. To do so, we consider various measures of β which can affect the role of political capital in firm operation. These measures include dependence on external finance, foreign ownership and local governance quality. We discuss below how each of these factors affects the relative value of politicians and consequently firms' preference between political and conventional human capital.

6.2.1 Dependence on external finance

As discussed in Section 2.1, a cross-country survey conducted by Batra *et al.* (2003) reports that firms in China are among the most constrained in the world in terms of access to capital. The level of financial constraints reported by Chinese entrepreneurs is similar to those prevailing in other transitional economies such as Czech Republic and Romania and poor economies such as Ghana and Ethiopia. Similar conclusions have been reached by surveys organized by the Chinese government. A research report based on a private-sector survey conducted in 2002 concludes that financing continues to be a major challenge for many private firms. This finding is not surprising given the controlled financial system in China. Even with the entrance and growth of many domestic and foreign banks and financial institutions in recent years, China's banking system is still mainly dominated by the four largest state-owned banks, i.e., Bank of China, People's Construction Bank of China, Agricultural Bank of China, and Industrial and Commercial Bank of China. According to Allen *et al.* (2008), around 30 percent of publicly listed companies' funding comes from bank loans; about 45 percent comes from self-fund raising, including internal financing and proceeds from equity and bond issuance. The lack of access to long-term capital and the resulting high dependence on self-fund raising constitutes a large impediment to business growth. An effective approach to overcome this impediment is to build political connections.

We hence consider next how the ratio of political capital ability relative to conventional human capital varies across firms dependent on their demand for external finance. We consider two measures. First, we use a simple capital-labor ratio. We identify, for each industry, the median firm's capital-labor ratio where capital is measured by the tangible fixed asset value and

labor the size of employment. Second, we construct an industry specific measure of external capital dependence following the approach of Braun (2003). This variable is measured for each industry by the median firm's share of capital expenditure that is not financed with cash flow from operation. Both of these variables are constructed based on all publicly listed companies. We interact these variables with firm productivity respectively and estimate specification (14). Tables 6 and 7 report the estimates. The evidence is broadly consistent with the expectation. We find that more productive firms tend to have a higher ratio of political ability relative to conventional human capital ability. This is especially true for firms in capital intensive industries and industries with a larger external capital dependence. This finding suggests that raising firms' capital access is a value exclusive to political investment; it increases firms' relative preference for political capital as compared to traditional human capital.

[Tables 6-7 about here]

6.2.2 Foreign ownership

In this sub-section, we examine how the relative importance of political capital in firm production can vary between foreign and domestically owned firms. Companies with foreign ownership may differ from domestic firms in three ways. First, firms with foreign ownership enjoy more favorable treatments from central and local governments. Haggard and Huang (2008) point out that since China became open to foreign direct investment, it has established a preferential regime for overseas investors. The preferential treatment includes moderate taxes and concessionary terms on land rental and utility rate. Second, firms with foreign ownership are less dependent on access to local bank loans. They rely more on funds from foreign investors as a main source of financing. Both of the above factors lower the marginal return of political investment and consequently the incentive to invest in political capital. However, foreign owned firms also tend to have less knowledge about government regulations and often experience a greater difficulty in navigating the complex institutional environment. Survey evidence presented in Rosen (1999), for example, suggests that Western investors in China are challenged by administrative difficulties and operational inefficiencies. They also are deterred in some cases by the lack of transparency and oversight. These attributes predict a stronger incentive to build political connections.

To test the above hypotheses, we include in Table 8 an indicator variable that equals 1 if the firm has more than 10 percent foreign ownership. The estimates suggest that firms with a significant foreign ownership have a lower ratio of political capital ability than their host-country domestic counterparts. This result lends support to the first two hypotheses where foreign owned firms are predicted to derive less benefit from employing politicians given the level of preference they already receive and the relatively lower level of dependence on host-country financing.

[Table 8 about here]

6.2.3 Local governance quality

As described in Section 2, local government officials in China retain a large degree of discretion after the administrative decentralization. For example, every investment contract has to be approved by some government level: provinces and economic zones have the authority to approve projects valued up to $30 million; county governments are able to approve projects below $10 million. Local governments are also responsible for enforcing national regulations such as the protection of intellectual property rights.

This decentralization led to a large dispersion in governance quality across administrative units. A recent survey conducted by the World Bank (2006) in 120 Chinese cities finds a significant geographic difference in institutional environment. Given the uniform rule of law, this difference was attributed to the varying governance quality across regions. For example, the statistics show that in the top 90th percentile cities, the average number of days of dealing with municipal government is around 36 per year, whereas firms in the bottom 10th percentile cities spend on average 87 days. There is also a substantial difference in companies' expenditure on entertainment, a variable that has been considered by studies such as Cai *et al.* (2009) as a measure of corruption. In cities of the top 90th percentile, entertainment expenditure constitutes 0.7 percent of revenue. Firms located in the bottom 10th percentile cities spend 1.7 times more. Based on these considerations, six cities, including Hangzhou, Qingdao, Shaoxing, Suzhou, Xiamen and Yantai, were evaluated to have a relatively superior institutional environment.

In this subsection, we investigate how geographic variation in governance quality affects the relative importance of political capital in firm operation and consequently the incentive to invest in political capital. We use the number of days dealing with governments available at the city level as a measure of government inefficiency and interact it with firm productivity.[33] Table 9 reports the estimation results of specification (14). We find that the degree of governance inefficiency exerts a significant effect on firms' incentive to recruit capable politicians as opposed to traditional human capital. At each productivity level, firms located in cities with more inefficient governments are matched with a significantly higher ratio of political capital ability.

[Table 9 about here]

6.3 Alternative explanation: extortion

In the above sections, we have interpreted our findings as evidence of positive assortative matching between firms and politicians. Now we examine whether there is an alternative interpretation that can plausibly explain these findings. The most likely alternative interpretation of our results would be a story of "extortion". In this explanation, the positive assignment we

[33] Note we already include city-year fixed effect in the estimations. We also considered firms' average expenditure on entertainment and confidence on contractual enforcement as alternative measures. The results were similar.

found empirically would be interpreted not as a mutually beneficial match but rather the self imposition by politicians. This argument relies on three assumptions. First, politicians possess the power of imposing themselves on non-state controlled firms. Second, firms do not derive any benefits from political connections. Finally, more powerful politicians would select the more productive and hence more profitable firms.

The first two assumptions are largely unlikely given the current institutional environment in China. As discussed in Section 2, with the proliferation of privatization, the direct influence of government officials on non-state controlled businesses has diminished substantially. These assumptions are also inconsistent with our results in Section 6.2. We found that the positive assignment between firm productivity and political ability is particularly strong for industries with high external finance dependence and cities with high government inefficiency. These results suggest that firms are more likely to match with politicians, especially those from the higher level of politician hierarchy, when there is likely a greater demand for political capital. If firms did not derive any benefits from political connections and the match is driven completely by politicians selecting and extracting rents from the most profitable firms, the matching mechanism would not vary across industries or locations in a systematic manner. More powerful politicians would simply pick the more profitable firms without giving any attention to the financial constraint faced by the firms.

6.4 The potential endogeneity of productivity

So far, we have examined the effect of lagged productivity on firms' decisions to invest in political and conventional human capital. The use of a time lag between firm attribute and investment decision helps establish the causal effect. Nonetheless, there still can be concerns of potential endogeneity in the estimated parameter of productivity due to, for example, omitted variables or reverse causality.

To address this concern, we employ in this subsection an instrumental variable (IV) approach. Plausible instruments in this case include the average productivities of upstream and downstream firms located in the same geographic region. The choice of these instruments is motivated by the growing economics literature on technology spillover, including the recent studies by Javorcik (2004), Haskel *et al.* (2007), and Keller and Yeaple (2007).[34] Javorcik (2004), for example, finds significant evidence of productivity spillover through backward linkage between foreign multinational and domestic firms. She shows that high productivity in downstream industries raises the productivity of upstream firms. In light of these findings, we construct two identification groups for each Chinese firm in the sample: (i) firms from upstream industries and located in the same province; (ii) firms from downstream industries and the same province.

[34] The majority of the above studies focus on the technology spillovers from foreign MNCs to domestic firms. For our purpose here, we consider all the firms producing in China as a potential source of spillover without distinguishing the structure of their ownership.

We compute the (input-output coefficient) weighted average productivity of each group and use them as the instruments.

We include both public and private firms in the IV construction. Data of private firms is obtained from Oriana, a comprehensive database containing financial information of public and private companies in over 30 countries including the Middle East and Asia-Pacific regions such as China. Based on this database, we obtain each firm's basic financial and industry information and calculate their productivity.[35] The input-output table used to compute the weighted average is taken from the OECD input-output database.

Similar to the literature, we find evidence of productivity spillover between vertically linked industries. The productivity of local downstream industries is positively correlated with upstream firms' efficiency. Similar is true for forward linkage: more productive upstream suppliers raise the productivity of downstream firms. Correcting for the potential endogeneity of productivity does not, however, change the matching of firms and politicians. As shown in Table 10, more productive firms continue to exhibit a stronger incentive to invest in political capital.

[Table 10 about here]

7 The Price of Political Capital: The Pay Ratio Hypothesis

After examining the matching of firms and politicians, we ask next: What is the relative price of political capital as compared to conventional human capital? Recall hypothesis 3 of Section 4 predicts that the pay ratio of politicians relative to traditional labor increases in the relative importance of political capital β and exceeds 1 when β is sufficiently large.

We test this hypothesis by considering the log form of equation (10).

$$\ln\left[\frac{w_g(\theta)}{w_l(\theta)}\right] = \lambda_{0w} + \lambda_{1w}\ln\beta. \tag{15}$$

where λ_{1w} is expected to be positive and $\lambda_{0w} + \lambda_{1w}\ln\beta > 0$ means that politicians receive a greater pay than their non-political co-workers. Let d_g denote an indicator variable that equals 1 if a director has previously held political positions and 0 otherwise. We can rewrite the above equation to:

$$\ln w(\theta) = (\lambda_{0w} + \lambda_{1w}\ln\beta)\, d_g + \lambda_{2w}\ln a_l + \sigma(\theta), \tag{16}$$

where $w(\theta)$ is the level of compensation offered to each director by each company (observed at firm-director-year level)[36], a_l includes conventional human characteristics, and $\sigma(\theta)$ represents

[35] Given the large number of missing values in capital and investment information, we use labor productivity as a proxy for efficiency.

[36] We focus here on the pay received by executives. Furthermore, we differentiate the different levels of executives by either including either a position fixed effect (e.g., separate dummy variables for CEO, senior managers and etc.) or restricting the data to a certain position such as top executive like CEO or general manager. Results obtained based on the former are reported here.

a vector of firm-year dummies and controls for all time-variant firm-level characteristics. This specification controls for the nonrandom matching between firms and human capital (including political human capital). It essentially estimates the price premium of political capital, i.e., $\lambda_{0w} + \lambda_{1w} \ln \beta$, based exclusively on within-firm variation.[37] Alternatively, we can replace d_g with political ability a_g to estimate the marginal effect of political ability.

We begin by first including the entire sample of executives, without differentiating existing and new hires. Table 11 reports the results. We find that politicians receive significantly greater compensation than their non-political co-workers as indicated by the positive and statistically significant parameter of the politician indicator. The pay gap is around 10 percent and is especially large for firms in industries with higher external finance dependence, as expected from hypothesis 3 in Section 4. Firms located in cities with higher government inefficiency also tend to offer a greater pay premium to politically endowed directors.

In the last four columns of Table 11, we replace the politician indicator variable with the political rank. The results indicate that a one-step increase in political rank leads to, on average, 6 percent increase in annual pay though the magnitude of the effect varies with the level of political rank. This exceeds the marginal effect of raising education attainment by one tier (e.g., from college to master degree) and obtaining professional credential.

[Table 11 about here]

Now we restrict the sample to new hires. This further mitigates the potential concern of correlation between the main explanatory variables and residuals, which can arise among existing directors. Table 12 reports the results. We find that newly hired directors with political capital receive significantly more pay than their colleagues in the same cohort. A one-step increase in political ladder leads to 7 percent increase in the compensation offer. When we differentiate the political ranks, we note that a one-step rise from Chu (third rank) to Ting (second rank) or from Ting to Bu (first rank) results in 12 percent more pay. This implies a pay premium of approximately US$5800. The effect of education attainment, on the other hand, appears insignificant.

[Table 12 about here]

8 Conclusion

Politician recruiting is an increasingly common phenomenon in China since the great economic transformation. It was exacerbated as the country undertook a sequence of bureaucratic reforms — raising the supply of local politicians — and a privatization process that led to a growing demand for political connections.

[37] The inclusion of firm-year fixed effect also means that firm characteristics, including productivity and foreign ownership, will drop out of the estimations.

We investigate in this paper how the differential decisions of firms to engage in political investment lead to a positive assortative matching of firms and politicians. We also examine how the matching mechanism in the political capital markets compares to the matching in traditional labor markets. Our results indicate that more productive firms are consistently more likely to hire politically endowed individuals than their less efficient competitors. They also tend to recruit politicians from a higher level of political hierarchy as suggested by the positive matching hypothesis of the model. The preference for political capital ability relative to conventional human capital increases in firms' dependence on external financing and the level of government inefficiency, but decreases in the extent of foreign ownership. We argue that these results offer evidence of mutually beneficial matching rather than alternative explanations such as extortion. The possibility that the matches are driven completely by politicians' self imposition on the most profitable firms is unlikely given that firms with greater financial constraints clearly employ more and stronger politicians. The assortative matching remains robust when we address the potential endogeneity of productivity using an IV approach and employing the average productivities of upstream and downstream firms located in the same province as identifying instruments.

In addition to the endogenous matching, we examine the relative price of political capital in comparison to conventional human capital. We find that directors with political endowment receive significantly more compensation than their co-workers. The political premium increases in the level of political strength and the potential importance of political capital. A one-step increase in the political ladder from, for example, municipal to provincial level leads to 12 percent more pay. Education attainment, on the other hand, appears to affect the compensation of existing directors only.

Our analysis conveys a number of broad implications. First, our results indicate that there is a significant variation, even within each industry, in the decisions to engage in political investment. Second, by introducing heterogeneity in factor markets including the markets of political labor, our paper helps identify potential sources of firm heterogeneity in overall efficiency. The role of political capital matching as a potential source of overall heterogeneity is particularly important in economies with under-developed institutional environment. Finally, our finding of positive assortative matching between firms and politicians suggests that the extent of firm dispersion in performance can be further widened as a result of political market assignment.

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Table 1: Summary statistics of director-level variables

Variables	Definition	Mean	Std.	Min	Max
Politician dummy	An indicator that equals 1 if the executive held a political position and 0 otherwise	0.03	0.18	0	1
Max rank	The highest political rank held by the executive	0.07	0.38	0	3
Number of posts	The number of political positions held by the executive	0.04	0.22	0	6
Ave. rank	The average political rank held by the executive	0.07	0.37	0	3
Education	The level of education of the executive	3.12	0.71	1	5
Pro. Qualification	An indicator that equals 1 if the executive has a professional credential or title	0.32	0.46	0	1

Table 2: Summary statistics of firm variables

Variables	Definition	Mean	Std.	Min	Max
Existing stock					
Politician dummy	An indicator that equals 1 if there is at least one politician and 0 otherwise	0.37	0.48	0	1
Politician count	The number of politicians on board	0.61	1.06	0	11
Max rank	The average of the highest rank held by the politicians	0.76	1.02	0	3
Num. of posts	The average number of political positions held by the politicians	0.42	0.59	0	4
Ave. rank	The average rank of political positions held by the politicians	0.74	1.00	0	3
Ave. education	The average education level of executives	3.16	0.37	1.57	5
Ave. qualification	The percentage of executives with professional credential	0.31	0.28	0	1
New hires					
Politician dummy	An indicator that equals 1 if there is at least one politician and 0 otherwise	0.20	0.40	0	1
Politician count	The number of politicians	0.31	0.76	0	9
Max rank	The average of the highest rank held by the politicians	0.42	0.85	0	3
Num. of posts	The average number of political positions held by the politicians	0.24	0.51	0	5
Ave. rank	The average rank of political positions held by the politicians	0.07	0.23	0	3
Ave. education	The average education level of executives	3.17	0.40	1	5
Ave. qualification	The percentage of executives with professional credential	0.31	0.34	0	1
Firm attributes					
Firm productivity	Estimated physical productivity (in log)	1.39	0.24	-0.30	2.09

Table 3: The matching of firms, politicians and conventional human capital

	Political Capital					Human Capital	
Dependent variables:	(1) Dummy	(2) Count	(3) Max rank	(4) Posts	(5) Ave. rank	(6) Educ.	(7) Qualif.
Productivity	0.28***	0.80***	0.65**	0.28***	0.65***	0.08**	0.16***
	(0.05)	(0.15)	(0.12)	(0.06)	(0.12)	(0.04)	(0.03)
City-year fe	yes	yes	yes	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes	yes	yes	yes
Num. of obs.	4054	4054	4054	4054	4054	3611	4054
R square	0.42	0.50	0.42	0.43	0.42	0.44	0.46
Root MSE	0.44	0.94	0.94	0.54	0.93	0.31	0.26

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 4: The matching of firms, politicians and conventional human capital: new hires

	Political Capital					Human Capital	
Dependent variables:	(1) Dummy	(2) Count	(3) Max rank	(4) Posts	(5) Ave. rank	(6) Educ.	(7) Qualif.
Productivity	0.18***	0.31***	0.46***	0.07***	0.07***	0.09	0.14***
	(0.05)	(0.12)	(0.12)	(0.03)	(0.03)	(0.08)	(0.04)
City-year fe	yes	yes	yes	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes	yes	yes	yes
Num. of obs.	2952	2952	2952	2952	2952	2095	2952
R square	0.41	0.41	0.41	0.43	0.44	0.48	0.45
Root MSE	0.38	0.73	0.83	0.22	0.22	0.38	0.32

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 5: The matching of firms, politicians and conventional human capital: firm revenue and new hires

	Political Capital					Human Capital	
Dependent variables:	(1) Dummy	(2) Count	(3) Max rank	(4) Posts	(5) Ave. rank	(6) Educ.	(7) Qualif.
Revenue	0.01***	0.03**	0.04***	0.02**	0.01*	0.01	0.01***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
City-year fe	yes	yes	yes	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes	yes	yes	yes
Num. of obs.	3293	3293	3293	3293	3293	2337	3293
R square	0.39	0.41	0.38	0.40	0.41	0.47	0.43
Root MSE	0.38	0.69	0.83	0.48	0.22	0.38	0.32

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 6: The ability ratio: the effect of capital intensity

Dependent variable:	Political / Human Capital Ratio			
	(1)	(2)	(3)	(4)
Political —	Max rank	Posts	Max rank	Posts
Human capital —	Education	Education	Qualif.	Qualif.
Productivity	0.30*	0.08	0.31***	0.06
	(0.17)	(0.12)	(0.12)	(0.07)
× Capital-labor ratio	0.02***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)
City-year fe	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes
Num. of obs.	2095	2095	2095	2095
R square	0.46	0.47	0.40	0.39
Root MSE	0.98	0.66	0.86	0.56

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 7: The ability ratio: the effect of external finance dependence

Dependent variable:	Political / Human Capital Ratio			
	(1)	(2)	(3)	(4)
Political —	Max rank	Posts	Max rank	Posts
Human capital —	Educ.	Educ.	Qualif.	Qualif.
Productivity	0.33***	0.11	0.28***	0.04
	(0.18)	(0.12)	(0.12)	(0.07)
× External finance dep.	0.04***	0.04***	0.04***	0.03***
	(0.00)	(0.00)	(0.00)	(0.00)
City-year fe	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes
Num. of obs.	2095	2095	2095	2095
R square	0.46	0.47	0.40	0.40
Root MSE	0.98	0.66	0.86	0.56

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 8: The ability ratio: the effect of foreign ownership

Dependent variable:	Political / Human Capital Ratio			
	(1)	(2)	(3)	(4)
Political —	Max rank	Posts	Max rank	Posts
Human capital —	Educ.	Educ.	Qualif.	Qualif.
Productivity	0.34**	0.10*	0.32***	0.07*
	(0.17)	(0.05)	(0.12)	(0.03)
Foreign ownership ind.	-0.49*	-0.26	-0.41***	-0.25**
	(0.31)	(0.22)	(0.17)	(0.11)
City-year fe	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes
Num. of obs.	2095	2095	2095	2095
R square	0.46	0.47	0.40	0.40
Root MSE	0.99	0.66	0.86	0.56

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 9: The ability ratio: the effect of government inefficiency

Dependent variable:	Political / Human Capital Ratio			
	(1)	(2)	(3)	(4)
Political —	Max rank	Posts	Max rank	Posts
Human capital —	Educ.	Educ.	Qualif.	Qualif.
Productivity	-1.11*	-1.06***	-0.54	-0.46*
	(0.64)	(0.47)	(0.40)	(0.27)
× Govt. inefficiency	30.14***	23.88***	18.29***	11.21**
	(12.19)	(8.68)	(8.00)	(5.35)
City-year fe	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes
Num. of obs.	2095	2095	2095	2095
R square	0.34	0.35	0.26	0.25
Root MSE	1.00	0.67	0.87	0.56

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 10: The matching of firm productivity and political ability of new hires: correcting for potential endogeneity of productivity

	Political Capital					Human Capital	
Dependent variables:	(1) Dummy	(2) Count	(3) Max rank	(4) Posts	(5) Ave. rank	(6) Educ.	(7) Qualif.
Productivity	0.20***	0.34***	0.48***	0.08***	0.08***	0.10	0.16***
	(0.06)	(0.12)	(0.14)	(0.03)	(0.03)	(0.08)	(0.05)
City-year fe	yes	yes	yes	yes	yes	yes	yes
Ind. fe	yes	yes	yes	yes	yes	yes	yes
Num. of obs.	2952	2952	2952	2952	2952	2095	2952
R square	0.43	0.44	0.42	0.41	0.45	0.48	0.46
Root MSE	0.38	0.71	0.83	0.49	0.21	0.38	0.32

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 11: The labor price equation: firm-director level (all directors)

Dependent variable: Director pay	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Politician dummy	0.10***	0.10***	-0.05				
	(0.04)	(0.04)	(0.13)				
× External finance dep.		0.02*					
		(0.01)					
× Govt. inefficiency			3.77**				
			(1.80)				
Max rank				0.06***		0.04*	-0.03
				(0.02)		(0.02)	(0.07)
Bu					0.14**		
					(0.07)		
Ting					0.10**		
					(0.04)		
Chu					0.09*		
					(0.04)		
× External finance dep.						0.01*	
						(0.00)	
× Govt. inefficiency							2.02**
							(1.02)
Education	0.04***	0.04***	0.03***	0.03***	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Professional qualif.	0.03***	0.04***	0.03**	0.03***	0.03***	0.04***	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Firm-year fe	yes	yes	yes	yes	yes	yes	yes
Num. of obs.	10,403	10,403	10,403	10,403	10,403	10,403	10,403
R square	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Root MSE	0.42	0.42	0.42	0.42	0.42	0.42	0.43

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table 12: The labor price equation: firm-director level (new hires)

Dependent variable: Director pay	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Politician dummy	0.13***	0.07*	-0.32				
	(0.05)	(0.04)	(0.27)				
× External finance dep.		0.08**					
		(0.03)					
× Govt. inefficiency			9.32**				
			(4.83)				
Max rank				0.07***		0.08*	-0.15
				(0.02)		(0.04)	(0.13)
Bu					0.24**		
					(0.11)		
Ting					0.12**		
					(0.06)		
Chu					0.14		
					(0.11)		
× External finance dep.						0.05*	
						(0.02)	
× Govt. inefficiency							4.45**
							(2.34)
Education	0.02	0.03	0.02	0.02	0.02	0.03	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Professional qualif.	0.05**	0.04*	0.04	0.05**	0.05**	0.04*	0.03
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Firm-year fe	yes	yes	yes	yes	yes	yes	yes
Num. of obs.	4162	4162	4162	4162	4162	4162	4162
R square	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Root MSE	0.46	0.46	0.46	0.46	0.46	0.46	0.46

Notes: (i) robust standard errors are reported in the parentheses; (ii) ***, ** and * represent statistical significance at 1%, 5% and 10% respectively.

Table A.1: The political hierarchy in China

Rank	Positions
Top leaders	General party secretary
	President
	Chairman of NPC
	Premiers, Vice Premiers
	State councilors
Bu	Minister
	Provincial party secretary
	Governor
Ting	Department head of government bureau
	Municipal party secretary
	Mayor
Chu	Division director of government bureau
	County party secretary
	County magistrate
Ke	Section chief of government bureau
	Township party secretary
	Township magistrate

Table A.2: The composition of participating politicians

Rank	2004		2005		2006		2007	
	Count	Share	Count	Share	Count	Share	Count	Share
Bu	114	0.13	77	0.12	113	0.16	146	0.19
Ting	689	0.78	531	0.80	531	0.75	581	0.73
Chu	75	0.08	52	0.08	63	0.09	66	0.08
Total	878	1.00	660	1.00	707	1.00	793	1.00

Table A.3: The correlation between political and conventional human capital abilities

	Max rank	Num. of posts	Ave. rank	Education	Pro. qualif.
Max rank	1.00				
Num. of posts	0.91	1.00			
Ave. rank	0.99	0.89	1.00		
Education	-0.02	-0.03	-0.02	1.00	
Pro. qualif.	0.02	0.01	0.02	-0.16	1.00