# Moving "Umbrella": Bureaucratic Transfers, Collusion, and Rent-seeking in China

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**Abstract**

The collusion between firms and government officials is ubiquitous but hard to empirically assess. This paper studies collusion by tracing the pattern of inter-city investments after political turnovers. Exploring the feature of bureaucratic transfers in China and using a unique firm registry data, this paper documents a significant increase of new investments with a close tie to the moving leaders' previous jurisdiction. Further empirical investigations find evidence consistent with a collusion between leaders and firms: First, new registrations tying to moving leaders concentrate in high-renting sectors. Second, the firms tying to moving leaders have a higher survival rate provided that their patrons stayed in the same jurisdictions, but those firms are more likely to exit local markets once the patrons left. Thirdly, the connected firms tend to crowd out new entries and dampens innovation. And lastly, career-concerned motives seem to mitigate collusion.

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# 1 Introduction

Power corrupts, but some powers are useful. When societies are featured with underprovision of public goods and a lack of healthy business environment, favoritism by powerful politicians sometimes substitutes formal institutions to facilitate market transactions and private investments. It is well-documented in the literature that firms with political connections enjoy advantages over unconnected ones in obtaining loans (Claessens et al., 2008; Khwaja and Mian, 2005; Kostovetsky, 2015; Li et al., 2008), getting access to public procurement markets (Amore and Bennedsen, 2013; Cingano and Pinotti, 2013), and acquiring lands at lower prices (Chen et al., 2017). By comparison, in large due to lack of data, little attention has been paid to the impact of collusion between politicians and business people on firm dynamics at extensive margin. For emerging markets, an important source of productivity growth stems from new entries (Brandt et al., 2013). Thus, studying how collusion affects firm dynamics is helpful for understanding the role of state in emerging economies.

This paper studies collusion by using inter-region investments after bureaucratic transfers in China as an identification strategy. China poses an evident challenge to the conventional wisdom in the political economy of development. On the one hand, institutional distortions and collusion seem to be ubiquitous (Bai et al., 2014). On the other hand, the recent decade witnessed a surprisingly robust growth in productivity, innovation, and entrepreneurship (Lardy, 2014; Wei et al., 2017). Yet it remains a mystery how collusion works and how it affects firm dynamics in China. Clarifying the mechanisms behind the collusion contributes to the general theoretical debate of how corruption affects economic growth. However, it is empirically very difficult to study collusion because it is under table and not available to the public.

In this paper, we explore two institutional features of China to identify collusion. The first feature is that the collusion between government officials and the business plays an important role in investment facilitation and resource allocation (Bai et al., 2014; Jia and Nie, 2015). Due to a high level of state control over the market and

severe institutional frictions, it is a commonplace for private firms to invest in political connections (guanxi) with powerful officials, often through bribery or rent-sharing, in exchange for the security of investment and other preferential treatments. Government officials rely on private firms to finance development projects, boost local economy, and provide rents for their private consumption or office-purchasing.

The second feature is that subnational leaders are rotated by their superiors among different regions (Xi et al., 2016; Yao and Zhang, 2015). Paradoxically, the design of such a rule is motivated to mitigate collusion, both among government officials and between officials and private firms (Kou and Tsai, 2014; Xu, 2011). However, rotation may not be able to completely eradicate collusion if firms move along with transferred leaders and receive convenience in forms of government subsidy, tax evasion, land acquisition, licence and permits, and the bypassing of regulations. In this case, the transferred leaders become a "moving umbrella",[1] which shields private interests from dealing with institutional imperfectness.

We rely on a unique database of the Chinese firm registration to undertake such tasks of empirical investigation. The previous literature mainly draw on publicly traded firms and focus on politically connected managers or members of the board of directors. However, publicly traded firms constitute only a small portion of the whole economy and are not entirely informative about newly emerged firm activities. In many occasions the collusion between government officials and the business sector is subtle: officials may rely on brokers instead of directly serving in the firms. In comparison, our database covers over ten million newly registered firms and provides thus far the most comprehensive information of new firm growth in China. Hence, our approach is useful for capturing the prevalence of collusion for firm activities at extensive margin and assessing its overall economic impacts in emerging economies.

Based on the dataset of business registry in combination with manually collected data on political turnovers at city and province levels, the empirical analyses document

[1]The term "moving umbrella" is a literal translation of a widely used Chinese word *Baohusan*, which means "protective umbrella".

a robust pattern of positive correlation between the transfer of leaders and inter-city flow of investments. Using the aggregate measure of capitals in business registry as a proxy of investment flow, we find that the transfer of a subnational leader from city A to B was associated with close to 3 percent increase in city B of new investments with legal owners being originally from city A. Similar patterns of investment increase are not observed within city pairs that did not experience a transfer and for within-dyad investment flows in the reverse direction. Exploring the dynamic effect of bureaucratic transfer shows that city dyads do not observe any increase of inter-city investments in years before the transfers.

We are aware that the interpretation about the correlation between transfers of officials and investment flows as a result of collusion and rent-seeking are speculative, and other non-corruption mechanisms can lead to similar patterns. One possibility is that transferred leaders facilitate market by alleviating informational asymmetry and policy uncertainty. Another possibility may be that transferred leaders have a strong reputation of personal capability for boosting local economy, through either past records or political connections to the superiors, so firms chase political stars to open new business in those cities. To clarify the underlying mechanisms, we investigate sectoral and ownership heterogeneity in the correlation between bureaucratic transfer and investments. We find that the increase of firm growth after bureaucratic transfers is concentrated in high-rent sectors and applies to private firms only, but not to state-owned enterprises. Because high-rent sectors and private firms are in a larger demand for political favoritism, the findings are consistent with the rent-seeking explanation for the identified pattern of inter-city firm flows.

The literature is divided on the economic impacts of reciprocal exchange between political power and private interests. We tackle this problem by examining how the existence of subnational leaders as "moving umbrellas" affect firm dynamics. First, we estimate the survival rates of firms with different kinds of originality. Using the Cox proportional hazards model, we find that firms following transferred leaders had the highest survival rate when the leaders remained in the same office. This finding

does not suggest that the connected firms are more economic viable, as their survival rates fall below the average of unconnected firms once their patrons left office. The discrepancy between survival rates of thus travelled firms with and without political connections suggest that the investments may have served for short-term purposes and were likely to have been contingent on personal relationship with subnational leaders. Secondly, we find that the share of connected firms is negatively associated with firm entries that are not connected to newly transferred leaders by regional proximity. Because unconnected firms on average outperform connected firms in terms of duration in the market, the deterrence effect of those connected firms on the entry of other firms is suggestive of capital misallocation in a fashion similar to the mechanism documented by Brandt et al. (2013).

We also account for officials' political incentives to serve as a "moving umbrella." The results using biographic and career data of local leaders are two-folds. First, the effect of a "moving umbrella" is stronger for leaders who were locally born and promoted in the previous jurisdiction and for leaders ineligible for promotion due to the retirement age limit. Second, subnational leaders who become "moving umbrellas" were more likely to be prosecuted afterwards for corruption. These results suggest that subnational leaders who collude with the business are more likely to be motivated by pecuniary gains. Career-concerned motivations nevertheless matter, to the extent that government officials are less likely to collude than those who are near retirement age. As a large literature has shown, personnel management based on promotion incentives is an important institutional foundation for promoting economic growth in China (Li and Zhou, 2005; Xu, 2011; Yao and Zhang, 2015). However, rent-seeking and collusion can go hand in hand with bureaucratic transfers, in particular for those with looming chance of promotion. Assuredly, the upper-level government does respond to collusion by prosecuting corrupted officials. The recent massive anti-corruption campaign further shows the government's determination.

This paper is closely related to the research investigating value, performance, and economic impacts of politically connected firms (Amore and Bennedsen, 2013; Cingano

and Pinotti, 2013; Faccio, 2006; Ferguson and Voth, 2008; Fisman, 2001; Fisman and Svensson, 2007; Chen et al., 2017; Li et al., 2008). The findings that connected firms are less capable of surviving market competition in the long term are consistent with the emphasis on the distortive effects of favoritism in the existing literature (Fisman and Wang, 2015; Fisman et al., 2017). In a broader sense, the paper also relates to economic analysis on corruption (Krueger, 1974; Murphy et al., 1993; Shleifer and Vishny, 1993) and the literature on political favoritism in resource allocation and public investments (Burgess et al., 2015; Hodler and Raschky, 2014). By focusing on firm dynamics following the transfer of subnational leaders, the findings that connected firms deter new entries and innovations shed new lights on economic consequences of favoritism and corruption in the presence of weak institutions.

The paper also contributes to the study on political incentives of public officials. The literature on electoral accountability holds that politicians are more likely to get reelected when economic performance is satisfactory (Besley and Case, 1995; Duch and Stevenson, 2010; Healy and Lenz, 2014) and get punished by voters for corruption (Ferraz and Finan, 2011; Timmons and Garfias, 2015). However, it is unclear how corruption may affect political careers in centralized nondemocratic systems. Suppose that corruption has positive effects on economic performance as suggested by the greasing-the-wheel arguments (Allen et al., 2005; Kaufmann and Wei, 1999), political leaders may want to collude with business interests to circumvent bureaucratic red tapes for a quick boom to local economy. The findings of this paper reject the premise that institutional distortions and corruption are a panacea for the economic growth of China. Notwithstanding a large literature showing how capable subnational leaders may help boost growth in China, their rent-seeking and collusion with the business only hinder productive entrepreneurial activities.

The remainder of this paper is organized as follows. Section 2 introduces the key institutional features. Section 3 describes the data. Section 4 presents the baseline results. Section 5 studies the economic consequences of the connected firms. Section 6 investigates how the pattern of connected firm is related to promotion incentives.

Section 7 concludes the paper.

# 2 Institutional Background

In this section, we discuss two institutional features that are directly relevant to the empirical strategy for studying political connections in China. The first feature is the ubiquitous collusion between subnational leaders and private interests, and the second feature is frequent transfers of officials among different regions by the political superiors.

In comparison with the centralized command-and-control system during the Mao era, the economic institutions in China evolved from the 1980s are featured with some degree of regional decentralization (Xu, 2011). Regional governments are endowed with substantial powers on economic affairs, including decisions on land acquisition, government subsidy, public procurement, and favoritism over local taxes and fees. The evaluation and promotion of regional leaders are highly contingent on the region's relative ranking on economic performance (Li and Zhou, 2005). This gives rise to strong incentives of subnational leaders to boost investments by all means, sometimes through personal patronage and collusion with private interests.

Despite remarkable economic growth in the recent decades, China falls short on weak institutional quality by international standards. As of 2011, China is ranked as the 75th out of 183 countries in the Corruption Perceptions Index reported by the Transparency International. In turn, personal networks stand out as a substitute for formal institutions to facilitate market activities (Xin and Pearce, 1996). The demands for the coverage by personal connections are particularly strong in regions where the rule of law is weak (Li et al., 2008; Chen et al., 2011). From firms' point of view, the endorsement from powerful officials helps reduce the cost of contract enforcement and provide protection for investments. Connected firms may further enjoy monopolistic rents through maintaining relational capitals and excluding rivals from the market. From officials' perspective, the personal networks with the private business constitute

a trustworthy resource of growth engine. Officials may also capitalize on their political power for private consumption and rent-seeking by offering preferential treatments to the private business. Using survey data of thousands of Chinese firms, Cai et al. (2011) report 20% of the wage bills to be expended as "Entertainment and Travel Costs", used primarily for maintaining collusive relationship with government officials.

The prevalence of corruptions and political collusion with the business has been an increasingly central concern of the ruling Communist Party of China (CPC). Following Xi Jinping's 2012 remark at a Politburo meeting that corruption would "inevitably lead to the downfall of the Party and the state" unless otherwise being contained,[2] massive anti-corruption crackdowns were pursued at all levels all over the bureaucratic system. As a result, over one million public servants were disciplined, sanctioned, or prosecuted for corruption as of 2016.[3] In particular, high-profile cases being reported in the anti-corruption campaigns illustrate political collusion in accordance with the pattern of "moving umbrellas," in which businessmen moved along with transferred subnational leaders to seek extra profits in new regions. For example, Wang Min, the former Party Standing Committee Member of Jiangsu Province during 2002-2005, was appointed as the Party Secretary of Liaoning province in 2009. After this assignment, many businessmen in Jiangsu followed his move to invest in Liaoning. They offered him bribery in exchange for winning the bids for several public projects. In 2016, Wang and his connected businessmen were prosecuted and penalized for taking bribes.[4]

In China, subnational leaders normally do not serve in the same region for too long before they are transferred, by promotion or lateral rotation, to other regions. Notably, subnational leaders do not decide for themselves which jurisdiction to serve. Their superiors do. The power to personnel control pertains to the CPC's party committee at the upper level. The institution of transfer was a mechanism for bureaucratic control dating back to the imperial China, with the primary intention of preventing

[2] https://www.bloomberg.com/news/articles/2013-12-30/china-s-xi-amassing-most-power-since-deng-raises-risk-for-reform

[3] http://www.bbc.com/news/world-asia-china-37748241

[4] http://news.xinhuanet.com/legal/2016-08/10/c_1119370548.htm

government officials from colluding with local elites in plotting against the rulers (Xi, 2017). In the contemporary China, transfers of city leaders are determined by the provincial party committees, and transfers of provincial leaders have to be approved by the politburo. In turn, a large proportion of subnational leaders serve in multiple different regions throughout their career, and the rate of political turnover is fairly high at subnational levels.

Importantly, transfers of subnational leaders do not follow strict timetables and are hard to predict *ex ante*. Although the year of the CPC's National Congress observes the highest frequency of turnovers, considerable number of transfers occur during other years throughout a political cycle. The terms of subnational leaders in a specific jurisdiction are not fixed and vary from one to ten years. Even when a leader expects a large chance of promotion or transfer as tenure increases, it is least likely to assure connected interests of his or her next jurisdiction so as to coordinate and invest in advance. The institutional setting of transferring subnational leaders implies that political turnovers can be considered as providing a valid source of exogenous variation of region-leader specific political connections.

# 3 Data

The empirical analyses use five data sets. First, the main data used for investigating the effect of bureaucratic transfers on investment flows are structured on a panel of city-dyads with the amount of inter-city investment flows being registered for each directed pair of cities. Second, we use firm-level data covering over ten million registered firms to conduct the duration analysis for different types of firms. The Chinese State Administration for Industry and Commerce requires that all firms formally register and provide legal proofs of paid-in capital. The database we use for analyses are uniquely obtained from the administration and it is thus far the most comprehensive data on new firm activities cross all regions and sectors in China. Third, we use a panel of city-sector data to study the impacts of politically connected firms on the

entry of other firms. Fourth, we adopt city-level data on innovation and GDP growth to evaluate the overall economic impacts of moving umbrellas. Fifth, we rely on a data on the career path of subnational leaders to examine the relationship between the scale of collusion with the business and officials' promotions and the probability of being investigated for corruption.

For empirical investigation, we focus on the sample of the 2000-2011 period. This was the period when China maintained a decade of economic boom together with rampant corruption. There were two big structural changes after 2012. The first change is that China underwent a growth adjustment, from the peak of annual growth by 14% down to 6.5% in recent years. The second shock is the start of a massive anti-corruption campaign, which led to the prosecution of thousands of high-ranking officials. Both economic slowdown and the anti-corruption campaign are bound to deter the incentive for a collusion between political officials and the business. In addition, the State Council implemented a set of reforms to streamline firm registration procedure from 2013, including the removal of requirements for the amount of paid-in capital in 2014. These structural changes render that the data of firm registrations from 2012 on will be a much noisier measure of entrepreneurial activities and may not precisely reflect real investment activities. We are mainly interested in examining the mechanism of rent-seeking and collusion, for which purpose the 2000-2011 period provides a suitable setting.

## 3.1 City-dyad Data Set

In the main data-set for the benchmark analyses, each observation is a directed dyad for two different cities. Altogether, the sample consists of 296 cities and 87,320 directed pairs for the 2000-2011 period.

**Investment Flows:** The dependent variables are constructed based on the scale of investment flows from city $i$ to $j$ in year $t$. The variable is obtained from the Chinese firm registry database, which provides information about firm location, the

year of establishment, exit, the value of registry capital,[5] and the original city of the firm's legal representative. Based on the original city of legal representatives, which is demonstrated by the first six digits of the representative's national identification number, we are able to identify whether a newly registered firm in city $j$ was connected to city $i$. We then proceed to construct two variables to measure investment flows from $i$ to $j$. The first variable is $\log(1+\text{FLOW}_{ijt})$, which is the logarithm of the sum of registry capitals of all firms established in city $j$ that were connected to city $i$ by tracing the ID number of the legal representatives. Note that the effective controller of a firm needs not be a legal representative, and a (relatively small) proportion of firms have corporate, instead of individual, as legal representative. Hence, our measure is arguably a lower bound of the scale of investment flows. The second variable is a dummy variable, $1(\text{FLOW}_{ijt}>0)$, which indicates whether the amount of investment measured by registry capital is strictly positive or not. The average amount of flowed capitals thus measured is 21.4 million Yuan in the whole sample, and the mean of $\log(1+\text{FLOW}_{ijt})$ among all city dyads in the sample is 1.646. Besides, 10.1% observations in the sample have strictly positive investment flows. Panel A of Table 1 reports descriptive statistics for investment flows.

**Official Transfers:** The main independent variable is $\text{TRANSFER}_{ijt}$, a dummy indicating whether there was at least one official among all cities or provincial leaders presiding city $j$ in year $t$ who had a previous job title located in city $i$. We consider five groups of government officials as city and provincial leaders: mayor, party secretary of a city, provincial governor, provincial party secretary, and other members of the provincial party standing committee. For city leaders, the coding for the transfer dummy is straightforward. For example, Sun Ruibin was the mayor of Cangzhou in 2005 and 2006, and he was the party secretary of Handan in 2007 and 2008 before he was transferred to the next jurisdiction. During 2005 and 2006, there were no other leaders presiding Handan whose previous jobs were in Cangzhou. In turn, the transfer

[5]The registry capital is not the firm's fixed assets. But according to Chinese Business Law, the registry capital should be proportional to the scale (and the assets) of the firm.

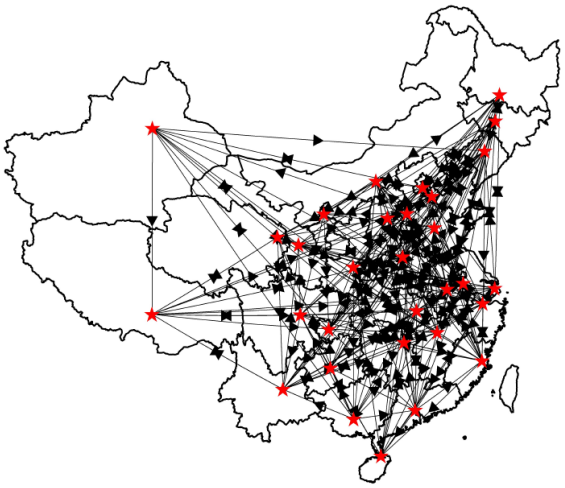
dummy is coded as 0 for the "Cangzhou→Handan" dyad for 2005-06 and as 1 for 2007 and 2008. If a city leader had one gap in his or her career record between two cities $A$ and $B$, we code $\text{TRANSFER}_{ABt}$ as 1 for the leader's tenure spent in city $B$. For example, Hu Ercha was the mayor of Chifeng in 2002 and 2003 and the party secretary of Baotou between 2006 and 2011. In between he was the director of the Development and Reform Commission of the Inner Mongolia Autonomous Region. In this case, we code the transfer dummy as equal to 1 for the "Chifeng→Baotou" dyad during the 2006-11 period.

For provincial leaders, of which we consider governors, provincial party secretaries, and the other members of the provincial party standing committee, we define their jurisdictions as widely as covering all cities in the province. In turn, when a provincial leader was transferred from province $A$ to province $B$, we specify the value of transfer dummy as 1 for all directed pairs from cities in $A$ to cities in $B$. Provincial leaders' powers and responsibilities usually cover all cities even though the physical location of the leader's job is confined in the provincial capital. Following the same principle, if a mayor or party secretary in city $x$ of province $A$ becomes a provincial leader of province $B$, we consider the transfer dummy to be 1 for all city pairs from $x$ to any city in province $B$. In case the official served for multiple jobs at the same time, we code the jurisdiction according to the job with the highest administrative ranking. Figure 1 shows the pattern of inter-province leader transfers during the period we investigate. It suggests that leader transfers are a commonplace across different regions. We are interested in studying to what extent the reshuffling of political leaders induces reallocation of firm activities cross the space.

## 3.2 Firm Survival Data

We investigate the survival of different types of firms in the market. For each firm, we code the yearly data of exit based on the information about termination in the Chinese Firm Registry Database. We control the logarithm of registry capital

Figure 1: Network by Transferred Provincial Leaders



Notes: The figure shows the pattern of inter-provincial transfer of provincial leaders between 2000 and 2011. Each arrow between provincial capital cities indicates that there was at least one transfer within the directed dyad for that period.

in the estimations of survival rate. We differentiate all firms into four groups. The first group is CONNECT_HOLD, which include all firms of city $j$ where a transferred leader remained in the same city. The second group is CONNECT_LEAVE, referring to firms registered in city $j$ and connected to a transferred leader who had left his or her jurisdiction in city $j$. The third group is LOCAL, including firms being established by local residents. The fourth, and the default group, are consisted of all firms established by individuals from other cities without having connections with transferred officials as specified in this paper. Panel B of Table 1 reports the shares of different types of firms in the sample. On average, the scale of connected firms is similar to that of unconnected firms, but much smaller than local firms.

## 3.3 Firm Entry Data Set

We evaluate the effects of political connected firms on other types of firms. The main dependent variable for use is $\log \text{K\_ENTRY}_{ist}$, the logarithm of the total registry capitals of newly registered firms of industry $s$ in city $i$ during year $t$. Specifically, we

calculate the scale of three types newly registered firms differentiated by their political connections: (1) local firms, (2) unconnected non-local firms, whose legal representatives were not local and did not come from the same city as did the incumbent leaders, and (3) connected non-local firms, i.e. the firms whose legal representatives moved with incumbent leaders from the same area. The main explanatory variable is CONNECT_SHARE$_{it}$, the registry capital share of existing connected firms in all firms in city $i$ during year $t$. The summary statistics for these variables are shown in Panel C of Table 1.

## 3.4 City Information

In various estimations throughout the paper, we control for city economic characteristics where applicable. The control variables include the logarithm of real GDP per capita and the logarithm of population, both at yearly levels. We also investigate the impacts of political connected firms on economic growth. For that purpose we calculate the annual growth rate in GDP per capita. All information are obtained from the China City Statistical Yearbooks. The summary statistics are reported in Panel D of Table 1.

## 3.5 Biographic data set

We assemble a set of variables with regard to leaders' personal background and career path. We use these variables to investigate intermediate channels of facilitating political connected investments and evaluate their impacts on political turnovers and the propensity of corruption. Depending on the purpose of analysis, the following variables may be constructed on city-pair bases or individual bases. Panel E of Table 1 presents the summary of main variables related to the leaders' career path.

**Officials' Characteristics** We conduct several tests with regard to what kinds of officials are most conducive to investment flows when moving to new jurisdictions. In the literature on regional favoritism and collusion, political leaders with high local

Table 1: Summary Statistics

| | N | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| | | | Panel A: City-dyad Data Set | | |
| log(1+ FLOW) | 1047840 | 1.65 | 2.09 | 0 | 17.63 |
| 1(FLOW> 0) | 1047840 | 0.10 | 0.30 | 0 | 1 |
| 1(TRANSFER) | 1047840 | 0.06 | 0.24 | 0 | 1 |
| log(GDP Per Capita, Origin) | 1047840 | 5.79 | 0.75 | 0 | 8.11 |
| log(GDP Per Capita, Destination) | 1047840 | 5.79 | 0.75 | 0 | 8.11 |
| log(Population, Origin) | 1047840 | 9.83 | 1.65 | 0 | 17.48 |
| log(Population, Destination) | 1047840 | 9.83 | 1.65 | 0 | 17.48 |
| NATIVE | 1047840 | 0.01 | 0.07 | 0 | 1 |
| LONG_TERM | 1047840 | 0.02 | 0.13 | 0 | 1 |
| | | | Panel B: Firm Survival Set | | |
| 1(Death) | 2438195 | 0.37 | 0.49 | 0 | 1 |
| CONNECT_HOLD | 2438195 | 0.02 | 0.13 | 0 | 1 |
| CONNECT_LEAVE | 2438195 | 0.02 | 0.12 | 0 | 1 |
| LOCAL | 2438195 | 0.719 | 0.45 | 0 | 1 |
| log(Paidin Capital) | 2438195 | 4.19 | 1.72 | 0.000 | 24.02 |
| | | | Panel C: Firm Entry Data Set | | |
| log(FLOW, New Entry, Unconnected) | 66228 | 2.66 | 3.66 | 0 | 16.79 |
| log(FLOW, New Entry, Connected) | 66228 | 8.07 | 3.69 | 0 | 23.09 |
| log(FLOW, New Entry, Local) | 66228 | 5.78 | 4.42 | 0 | 24.09 |
| Share of Connected Firms | 64596 | 0.03 | 0.09 | 0 | 0.88 |
| | | | Panel E: Biographic data set | | |
| Turnover | 712 | 0.86 | 0.55 | 0 | 2 |
| log(Connected Capital Flow, Term) | 712 | 2.43 | 4.48 | 0 | 15.53 |
| 1(Corruption) | 506 | 0.10 | 0.30 | 0 | 1 |
| log(Connected Capital Flow, Career) | 506 | 4.52 | 5.37 | 0 | 15.53 |

network homophily are more likely to act in accordance with local interest groups. Motivated by those observations, we construct a dummy variable $\text{NATIVE}_{ijt}$, which takes value 1 if at least one leader presiding city $j$ at time $t$ previously worked in city $i$ and that official was born in city $i$. A hometown affiliation implies a shared cultural belief between the leader and local interest groups, which helps them build the trust. We also account for the impact of the length of previous tenure. The dummy variable $1(\text{TENURE} \geq 5\text{YR})$ indicates that an official had served in his or her previous position with a tenure of five years or more. For the whole sample of officials, a proportion of 28.8% had served for a long tenure of five years or more.

Due to the rules of mandatory retirement, provincial leaders must retire by 65, and city leaders must retire by 60. In turn, provincial leaders who do not get promoted by 63 will have little chance of promotion and are likely to be transferred to ceremonial positions. By a similar token, 58 becomes a *de facto* retirement age limit for city leaders. We capture the officials' incentives in view of their distance to retirement age. $1(AGE \geq RL)$ is a dummy variable indicating whether an official moving from city $i$ to $j$ reached the *de facto* retirement age, that is, 63 for provincial leaders and 58 for city leaders. In our sample, 5% of the observations reach the *de facto* retirement limit.

**Turnovers and Prosecutions** In section 5, we investigate how the scale of politically connected investment flows affect the career advancement of subnational leaders. For this purpose, we constructed several variables based on the official-term observations. $\text{TURNOVER}_{ij}$ is a three-value categorical variable: 0 if the official's political career is terminated following the term;[6] 1 if the official served in a different jurisdiction and remained at the same level; and 2 if the official was promoted. In the sample, 23.5% of the leader-terms ended up with termination, 67.4% remained at the same ranking, and 9.1% received a promotion.[7] We also construct a dummy variable $\text{CORRUPT}_i$ for each subnational leaders appearing in the sample. The value

[6] An official's political career can be terminated for different reasons, including formal retirement, being sanctioned for corruption or negligence, such as severe workplace accidents, and health issues, and so on.

[7] The biographic information of officials are obtained from the data set Political Leaders in Contemporary China (PLCC).

of dummy takes 1 if that official was investigated or prosecuted for corruption as of the end of 2016. The information is based on the official website of the Central Commission for Discipline Inspection (CCDI) of the CPC.[8] Among all the 506 leaders who had been transferred at least once, a tenth were found corruptive afterwards.

# 4 Baseline Results

## 4.1 Official Transfers and Investment Flows

The baseline model for estimating the effect of bureaucratic transfer on firm flows along the same direction as the transfer does is specified as the following equation.

$$\log(1 + \text{FLOW}_{ijt}) = \alpha \ \text{TRANSFER}_{ijt} + X_{ijt}\beta + \lambda_{ij} + \gamma_t + \delta_t \times \eta_{ij} + u_{ijt} \qquad (1)$$

In Equation (1), the subscript $ijt$ specifies the direction of investment flows from city $i$ to $j$ during year $t$.[9] $\alpha$ is the main parameter of interest. $X_{ijt}$ is a vector of control variables, including the logarithm of real per capita GDP and the logarithm of populations in both cities at time $t$. $u_{ijt}$ is the term of random disturbance. In addition, $\lambda_{ij}$ denotes city-dyad fixed effects, $\gamma_t$ stands for year fixed effects, which we control throughout the baseline estimations. Controlling city-dyad and year fixed effects addresses two potential channels of endogeneity: (1) some city-dyads are more closely connected to each other than to other cities, and they have both more exchanges of leaders and more inter-city investments; and (2) there are overall increases in the frequency of leader transfers and the amount of inter-city investments in some years, presumably due to political business cycles. Besides, investment flows are likely to be correlated with the long term trajectory of economic development in specific regions,

[8] `http://www.ccdi.gov.cn`

[9] We mainly focus on the transfers of leaders and firms between cities. We also study the pattern of the inter-province transfers and get qualitatively similar results. The results are reported by Table A1 in the appendix.

Table 2: Baseline Results

| Dependent Variable | log(1+FLOW) | | | | 1(FLOW>0) | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1(TRANSFER) | 0.029** | 0.028** | 0.027** | 0.030** | 0.003*** | 0.003*** | 0.003** | 0.004** |
| | (0.012) | (0.012) | (0.012) | (0.012) | (0.011) | (0.001) | (0.001) | (0.002) |
| Controls | N | Y | Y | Y | N | Y | Y | Y |
| Dyad FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Regional Political Cycles | N | Y | Y | Y | N | Y | Y | Y |
| Transferred Dyads Only | N | N | N | Y | N | N | N | Y |
| R-squared | 0.066 | 0.067 | 0.067 | 0.034 | 0.021 | 0.021 | 0.022 | 0.022 |
| Observations | 1,047,840 | 1,047,840 | 1,047,840 | 222,632 | 1,047,840 | 1,047,840 | 1,047,840 | 222,632 |
| Number of City Dyads | 87,320 | 87,320 | 87,320 | 18,636 | 87,320 | 87,320 | 87,320 | 18,636 |

The sample covers 87,320 city dyads from 2000 to 2011. In all columns city-dyad and year fixed effects are included. Controls include log per capita real GDP and log population of both the origin and the destination cities. Regional political cycles refer to the interaction between two regional dummies and a dummy for the year in the national political cycle. * Significant at 10%, ** 5%, *** 1%.

which may consequentially bias the estimate if cities on the economic rising trend systematically export more or less leaders. Due to the legacy of planned economy, economic endowments and industrial structures of cities in China tend to be clustered in specific administrative regions. Altogether, the degree of spatial correlation in the level of economic development is high within each of following six regions: North, Northeast, East, South, Southwest, and Northwest. To deal with this problem, we control a set of region-specific time trends, $\delta_t \times \eta_{ij}$, which are constructed by interacting two region dummies for each city dyad with the time trends for each political cycles following the CPC's National Congress.

Table 2 presents the baseline estimates. In all specifications, we cluster the standard errors at the city-dyad level. In column (1) of Table 2, we only control city-dyad fixed effects and year fixed effects. The coefficient for $\text{TRANSFER}_{ijt}$ is 0.029 and significant at the 0.05 level. Column (2) includes basic control variables, the logarithm of real GDP per capita and the logarithm of population of both cities. Column (3) further adds the regional time trends. The estimated coefficients are similar to those provided in column (1). For robustness, we also estimate the effect of leader transfer using only city-dyads that had experienced at least one transfer for the sample period. As column (4) of Table 2 shows, this leads to a shrink in the sample size but the estimated coefficient is unchanged.

Columns (4) through (6) of Table 2 present the estimated results using the dummy variable $1(\text{FLOW}_{ijt} > 0)$ as the dependent variable. The coefficients for $\text{Transfer}_{ijt}$ for most specifications are about 0.03 and statistically significant at conventional levels. For the whole sample, the rate of observing a positive flow of inter-city investments as defined by Section 3.1 is one in ten. The results reported in Columns (4) to (6) imply that a leader transfer between two cities increases the probability of positive investments in the following years of the leader's tenure by 3%. For the transfer of provincial leaders, the total impact is amplified by the definition of leader transfers. For example, a transfer of provincial leader from Shanxi Province to Shandong is then associated with an increase in investment of total registry capitals by approximately

120 million Yuan (about 18.5 million US dollars).[10]

## 4.2 Placebo Tests

Table 3: Placebo Tests

| Dependent Variable | log(1+ FLOW) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| l(TRANSFER), Randomly Reassigned | 0.010 | | |
| | (0.008) | | |
| l(OTHER) | | -0.052*** | |
| | | (0.010) | |
| l(TRANSFER) | | 0.028** | |
| | | (0.012) | |
| l(TRANSFER), Inverted | | | 0.008 |
| | | | (0.008) |
| Controls | Y | Y | Y |
| Dyad FE | Y | Y | Y |
| Year FE | Y | Y | Y |
| R-squared | 0.027 | 0.067 | 0.027 |
| Observations | 1,047,840 | 1,047,840 | 1,047,840 |
| Number of City Dyads | 87,320 | 87,320 | 87,320 |

The sample covers 87,320 city dyads from 2000 to 2011. In all columns city-dyad and year fixed effects are included. Controls include log per capita real GDP and log population of both the origin and the destination cities. * Significant at 10%, ** 5%, *** 1%.

The baseline results presented in Table 2 suggest that leader transfers across cities are associated with a spike of investment flows between the two cities. However, this phenomenon may be due to firm relocations instead of political connections to transferred leaders. We provide a set of placebo tests to determine whether the estimated coefficients are driven by some unobserved factors correlated to leaders' transfers. First, it is possible that investment flows were largely random but the results were driven by a spurious correlation between intense leader moves and investments in some city-years that are not fully captured by region specific time trends. In Column (1) of Table 3, we present the estimate for the "effect" where the treatment group is randomly assigned city-dyads in proportion to the number of real transfers each year.

[10]There are 11 prefecture level cities in Shanxi and 17 cities in Shandong. Since the mean of inter-city investment flows is 21 million Yuan, thus the expected increase in inter-city investment flows in total is about $21 \times 0.03 \times 11 \times 17 = 120$.

The estimated coefficient is insignificant.

Second, leaders newly transferred to a city may have strong incentives to boom local economy, hence they exert high efforts to attract investments elsewhere, in particular from their previous jurisdictions. To differentiate the effect of investment facilitation by transferred leaders from the effect of political connection, we implement a placebo test in which the explanatory variables include both $\text{TRANSFER}_{ijt}$ and a dummy variable $1(\text{OTHER})_{ijt}$, which indicates that there is at least one incumbent leader in $j$ who was transferred from a third city other than from $i$. Interestingly, as Column (2) of Table 2 reports, the coefficient for $1(\text{OTHER})_{ijt}$ is significantly negative, while the estimate for $\text{TRANSFER}_{ijt}$ is almost unchanged. This result essentially rules out the possibility that the effect is solely due to investment facilitation cross cities.

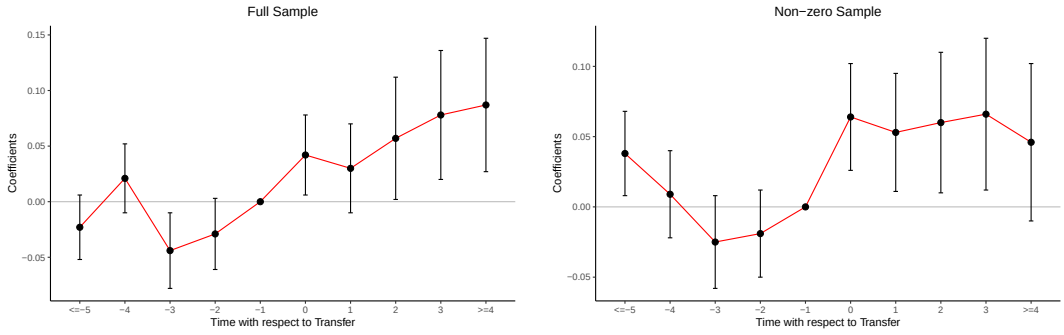
Thirdly, it is possible that transferred leaders help reduce transaction costs and lower institutional entry barriers, so investments from both cities are increased. In Column (3) of Table 2, we estimate the baseline model using the inverted variable for transfer, that is, $\text{TRANSFER}_{jit}$, as the explanatory variable for investment flows $\text{FLOW}_{ijt}$. The coefficient is insignificant and the magnitude is much smaller than the baseline result for $\text{TRANSFER}_{ijt}$.

## 4.3 Dynamic Effects

Although bureaucratic transfers are determined by their political superiors, the assignments may be coordinated with economic initiatives from upper levels which are simultaneously correlated with inter-city investment flows. The possibility of investment coordination arranged by the superiors gives rise to a concern about reverse causality: that is, leaders are selected as an agent of specific policy initiates to bolster local economy. In this case, investment flows may have occurred anyway regardless of the direction of leader transfer. To test this mechanism, we estimate the dynamic effects of bureaucratic transfer on investment flows in a city-dyad. The equation for estimation is specified as the following.

$$\log(\text{FLOW}_{ijt}) = \sum_{\tau=-d_1}^{0} \alpha_\tau \text{ TRANSFER}_{ijt} \times \rho_{ij,t+\tau} + \sum_{\kappa=2}^{d_2} \alpha_\kappa \text{ TRANSFER}_{ij,t+\kappa} \times \mu_{ij,t+\kappa} + X_{ijt}\beta + \lambda_{ij} + \gamma_t + u_{ijt} \quad (2)$$

Figure 2: Dynamic Effects of the Transfers




Notes: The figures illustrate the dynamic effects of a leader transfer on $\log(1+\text{FLOW}_{ijt})$. In both figure, the horizontal axis indicates the year since a city-dyad experienced a leader transfer. Time 0 indicates the first year of the new leader's tenure. The vertical axis corresponds to the estimated dynamic effects. The results are estimated using the baseline specification (with controls, city-dyad fixed effects and year fixed effects) with the difference that the transfer dummy is replaced by the interaction terms of the transfer dummy and a set of time dummies. The coefficient at time $-1$, the last year before new leader's arrival, is normalized to 0. The 95% confidence interval around each plotted coefficients are reported, with standard errors being clustered at the city-dyad level. The left panel presents the results obtained from the full sample. The right panel presents the results obtained from using city-dyads that experienced at least one leader transfer in the 2000-11 period.

Because the timings of treatment are not the same for all city-dyads, the conventional method for estimating the dynamic effects is not readily applicable. In Equation (2), investment flows from $i$ to $j$ during time $t$ are evaluated dynamically for a hypothetical time window $[t-d_1, t+d_2]$. The dummy variable $\text{TRANSFER}_{ijt}$ indicates that an incumbent leader presiding city $j$ at time $t$ was previously transferred from city $i$. The dummy variable $\rho_{ij,t+\tau}$ indicates whether the "moving umbrella", that is, the official who moved from city $i$, present at time $t$ was first appointed to $j$ at time $t+\tau$. The subscript $\tau$ is an indicator of time periods prior to $t$, with $d_1$ represents the period leading $t$ for four years or more. In turn, the coefficients $\alpha_\tau$ capture the post-trend

of the effect of leader transfer on investment flows: that is, how a newly transferred leader affects investment flows in the subsequent years conditional on that he or she remains in office. By contrast, the dummy variable $\text{TRANSFER}_{ij,t+\kappa}$ characterizes whether there is a transferred leader from $i$ to $j$ at time $t+\kappa$, and the dummy $\mu_{ij,t+\kappa}$ stands for that the leader was *not* in office at time $t$. The superscript $d_2$ represents the period lagging $t$ for five years or more. Following these definitions, $\alpha_\kappa$ capture the pre-trends of moving leaders' effect on investments: how a transferred leader may "affect" investment flows before he or she assumes power.

Figure 2 presents the dynamic effects of being presided by a transferred leader on the investment flows within the city-dyad. Note that the effect of the transfer at time $t+1$ on the investment at time $t$, which corresponds to $t=-1$ on the horizontal line, is normalized to zero. The coefficients at $t=-2,-3,...$ stand for the estimates for $\alpha_\kappa$, the pre-trends of difference between the treated group and the control group. In turn, the coefficients at $t=0,1,2...$ stand for the estimates for $\alpha_\tau$, the post-trends of difference between the treated group and the control group. The left panel presents the estimates using the full sample, while the right panel presents the estimates using only the city-dyads that had experienced at least one transfer during the 2000-11 period.

It is clear from Figure 2 that a transfer of leader from any city $i$ to $j$ does not make investment flow from $i$ to $j$ faster than within other city-dyads for all the five years before the transfer occurs. The estimated pre-trend differences are either negative or insignificant in most cases. The investment flow from $i$ to $j$ in the treated group six years or more before the transfer is somewhat faster than that in the control group. However, the average tenure of city leaders is about 3 years, meaning that superiors coordinate bureaucratic transfers and investment flows two terms in advance. This scenario is next to impossible given a similar pattern of frequent reshuffle at the upper level. At the same time, the post-trend differences between the treated and the control group are positive and highly significant for most cases. The robustness on the dynamic effects lends further supports to the idea that transferred leaders themselves, rather than policy coordinations at the upper levels, have played a major role in inducing

investment flow along the same directions of transfers.

## 4.4 Sectoral and Ownership Heterogeneity

Admittedly, the results presented in the previous sections are not direct evidence that transferred leaders carried on private interests and seek rents from collusion. Nevertheless, as long as corruption is partially responsible for the increase in inter-city investments following transfers, a higher concentration of corruption in certain areas would imply a relatively more telling effects of leader transfers on investment flows. Hence, any findings in line with this proposition are consistent with the speculation that collusion may have been a driving force behind investment flows accompanying bureaucratic transfers.

We explore two kinds of firm heterogeneity to test this idea. First, we divide all firms into two groups, hight-rent and low-rent sectors, based on the sector-average profit-to-asset ratios. As in Huang et al. (2017), we define high-rent sectors as those with above-median profit-to-asset ratios, and low-rent sectors as those with below-median profit-to-asset ratios. We then calculate the investment flows in high/low-rent sectors, respectively, and estimate the baseline model separately. Second, we distinguish different types of ownership for all firms. We define a firm as one of the following three types: state-owned, collectively owned, and privately owned, through identifying whether the effective controller is state or state-owned-enterprises, collective community, or individuals in the registry information. We expect that the results to be more significant for private firms than for state-owned enterprises and collective ownership, as private firms are the least assured of institutional commitments to the rule of law and rely more on the patronage network provided by political leaders.

Columns (1) and (2) of Table 4 report the estimates for effects of leader transfers on directed investment flows in high-rent sectors. Similar as the baseline results, the coefficients for leader transfer are positive (0.02) and statistically significant. The size of coefficients obtained for high-rent sectors is slightly smaller than that obtained using

Table 4: Heterogeneity by Industry and Ownership

| Dependent Variable | log(1 + FLOW) | | | | | | |
|---|---|---|---|---|---|---|---|
| | By Industry | | | | By Ownership | | |
| | High Rent Sectors | | Low Rent Sectors | | State-owned | Collective | Private Firms |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1(TRANSFER) | 0.020** | 0.019* | 0.005 | 0.004 | -0.005 | -0.002 | 0.034*** |
| | (0.010) | (0.010) | (0.010) | (0.010) | (0.004) | (0.003) | (0.011) |
| Controls | N | Y | N | Y | Y | Y | Y |
| City Dyad FE | Y | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y | Y |
| R-squared | 0.052 | 0.052 | 0.027 | 0.028 | 0.001 | 0.004 | 0.072 |
| Observations | 1,047,840 | 1,047,840 | 1,047,840 | 1,047,840 | 1,047,840 | 1,047,840 | 1,047,840 |
| Number of City Dyads | 87,320 | 87,320 | 87,320 | 87,320 | 87,320 | 87,320 | 87,320 |

The sample covers 87320 city dyads from 2000 to 2011. In all columns city-dyad and year fixed effects are included. Controls include log per capita real GDP and log population of both the origin and the destination cities. High-rent sectors include those with above-median profit-to-asset ratios, and low-rent sectors correspond to those with below-median profit-to-asset ratios * Significant at 10%, ** 5%, *** 1%.

total investments, perhaps because the volume of hight-rent investment is a subset of the total. In contrast, the same estimations for investment flow in low-rent sectors yield insignificant coefficients with much smaller magnitudes, as shown in Columns (3) and (4). The discrepancy between high-rent and low-rent sectors in the effect of leader transfer is consistent with the premise that corruption (rent-seeking) is an important underlying force of inter-city investment flows. In addition, the estimates exploring ownership heterogeneity presented in Columns (5) through (7) are also consistent with our conjecture. The effects are non-existent for state-owned enterprises and firms of collective ownership, however, measuring investment flows considering only private firms yields significant coefficient close to that of the baseline results.

# 5 Economic Impacts

## 5.1 Survival Rates for Different Types of Firms

If collusion is a driving force of inter-region investments, their performance should exhibit a different pattern from those normal investment flows in the absence of leader transfers, reflecting rent-seeking activities. Empirical evidence is mixed on the impacts of collusion on firms' performance. On the one hand, payments to corrupted leaders may be an investment on political connections and access to regulated markets, so connected firms may benefit from corruption with a social cost (Cingano and Pinotti, 2013; Chen et al., 2017). On the other hand, dealing with powerful leaders implies spending resource on unproductive purposes. Thereby, the dependence on political rent-seeking may undermine entrepreneurship and innovation (Baumol, 1990), lowering connected firms' profitability and productivity in the long term (Earle and Gehlbach, 2015; Fisman, 2001).

Due to lack of data on investments and profits, we are unable to directly study the effects of being connected to transferring leaders on firms' performance. Instead, we use the information on the time of registration and cancellation in the registry data

set to study the survival rate of different types of firms. Specifically, we estimate the hazard rate of a firm to drop out through Cox Proportional Hazards model.

$$h_{i,p}(t) = h_0(t)\ \exp[\alpha_1\ \text{CONNECT\_HOLD}_{i,t} + \alpha_2\ \text{CONNECT\_LEAVE}_{i,t} + \alpha_3\ \text{LOCAL}_{i,t} + \beta\ \log(\text{CAPITAL}_i) + \delta_p + \mu_t] \quad (3)$$

The dependent variable $h_{i,p}(t)$ is the hazard of firm $i$ located in province $p$ to drop out at time $t$. Function $h_0(t)$ represents the nonparametric baseline hazard of exit. The key independent variables are three dummies characterizing the type of firms. $\text{CONNECT\_HOLD}_{i,t}$ indicates that the firm (1) has a nonlocal legal representative, and (2) is connected with a transferred leader, and (3) at time $t$ that leader remained in office where firm $i$ registered. $\text{CONNECT\_LEAVE}_{i,t}$ indicates whether the firm (1) has a nonlocal legal representative, and (2) is connected with a transferred leader, and (3) as of time $t$ that leader left office. $\text{LOCAL}_{i,t}$ specifies whether the legal representative of that firm is a local resident at time $t$. The base group consists of firms with legal representatives from cities other than the firm's location and incumbent leaders' previous job location. Hence, they are not considered as connected by our definition. The four categories are mutually exclusive and the coefficients of $\alpha_1$ to $\alpha_3$ reflect the differentiated likelihood of drop-out for the three groups in proportion to that of the base group. In addition, we control for the logarithm of registry capitals, province fixed effects, along with the year dummies indicating when the firms were established.

Table 5 presents estimates for the Cox Proportional Hazards models. In Column (1), where only the three group dummies are controlled, the coefficient for LOCAL is -0.026 and significant at 0.01 level. So firms established by local people seem to be more resilient than those by nonlocals without connections. Interestingly, the survival rates are bifurcated between nonlocal connected firms and the firms which were once connected but lost connections because of political turnover. The coefficients of CONNECT_HOLD and CONNECT_LEAVE are respectively -0.235 and

Table 5: Firm Survival: Cox proportional hazard rate

| Dependent Variable | Hazard Rate | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| CONNECT_HOLD | -0.235*** | -0.217*** | -0.159*** |
| | (0.013) | (0.013) | (0.013) |
| CONNECT_LEAVE | 0.182*** | 0.186*** | 0.154*** |
| | (0.012) | (0.012) | (0.012) |
| LOCAL | -0.026*** | -0.086*** | -0.146*** |
| | (0.003) | (0.003) | (0.003) |
| log(CAPITAL) | | -0.213*** | -0.216*** |
| | | (0.001) | (0.001) |
| Provincial Dummies | Y | Y | Y |
| Establish Year Dummies | N | N | Y |
| Log pseudo-likelihood | -13,086,401 | -13,031,786 | -12,979,282 |
| Observations | 2,438,195 | 2,438,195 | 2,438,195 |

Notes: The sample covers over two million firms established during 2000-2011. Base group: unconnected & established by people out of the province. We randomly choose one sixth of the full sample to avoid calculation difficulties. * Significant at 10%, ** 5%, *** 1%.

0.182. This implies that the firms of the first category are 21% less likely to exit the market ($1 - \exp(-0.235) = 0.21$) than the base group, but the same set of firms can become 20% more likely to exit the market once the "moving umbrellas" are gone ($1 - \exp(0.182) = 0.20$). Unsurprisingly, firm survival is positively associated with the scale measured by the registry capital. But neither the scale, province dummies, nor establish-year dummies change the estimates qualitatively, as Columns (2) and (3) show.

The divergence in the survival rates between firms connected with incumbents and those connected with former leaders is in support of the logic of collusion. One explanation for the puzzling pattern of firm survival is that the connected firms were simply less efficient, and they had to rely on the patronage by subnational leaders to be sustained in market competition. A second explanation is that those connected firms mainly served the purpose of rent-seeking and money laundry, and they pulled out of the market once their connections were gone. In both cases, political leaders serve as agents of private interests in facilitating inter-city investments.

## 5.2 Impacts on Firm Entry

We now turn to evaluate the impacts of politically connected firms on the whole market. We focus on the entry of new firms. If collusion is an important channel of inducing connected investments, the existence of such activities may raise transaction costs and deter the entry of potential entrepreneurs. Suppose otherwise, firms follow leaders because of the latter's strong reputation for managing local economy, either through pro-market policies and infrastructure investments, we should expect more firms to follow the successful predecessors of those connected firms. To fulfill the tests we estimate the scale of new investments, proxied by the sum of registry capitals, by each city-sector as the following equation.

$$\log \text{K\_ENTRY}_{ijt} = \gamma \log \text{K\_STOCK}_{ij(t-1)} + \alpha \text{ lag SHARE}_{i,t-1} + \beta X_{it} + \lambda_{ij} + \lambda_t + t \times \lambda_i + t \times \lambda_j + \epsilon_{ijt} \quad (4)$$

In Equation 4, the dependent variable is $\log \text{K\_ENTRY}_{ijt}$, the logarithm of the sum of registry capitals of firms of sector $j$ established in city $i$ and year $t$. The variable of interest is $\text{SHARE}_{i,t-1}$, the share of political connected firms in the sum of registry capitals among all firms present in city $i$ at time $t-1$. We consider this share as a measurement for the pervasiveness of political collusion between transferred leaders and the business. We control for $\log \text{K\_ENTRY}_{ijt}$, the stock of all registry capitals by city-sector in the last period. $X_{it}$ is a vector of city level controls including the logarithm of real GDP per capita, logarithm of population, urbanization rate, and the share of output in the secondary industry. We include city-sector fixed effects ($\lambda_{ij}$), year fixed effects ($\lambda_t$), and city and sector specific time trends ($t \times \lambda_i$ and $t \times \lambda_j$) for robustness check.

Table 6 presents the estimates respectively concentrating on the entry of three types of firms: nonlocal connected firms, nonlocal connected firms, and local firms.

Table 6: Entry Deterrence Effects

| Dependent Variable | log K_ENTRY, Connected | | | log K_ENTRY, Unconnected | | | log K_ENTRY, Local | | |
|---|---|---|---|---|---|---|---|---|---|
| | Panel A: Full Sample | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| lag SHARE | 1.836*** | 1.836*** | 1.836*** | -0.267 | -0.325* | -0.339* | -0.115 | -0.249 | -0.246 |
| | (0.237) | (0.237) | (0.237) | (0.180) | (0.183) | (0.182) | (0.171) | (0.189) | (0.188) |
| Controls | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| City-Industry FE | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| City Linear Year Trend | N | Y | Y | N | Y | Y | N | Y | Y |
| Industry Linear Year Trend | N | N | Y | N | N | Y | N | N | Y |
| R-squared | 0.084 | 0.128 | 0.160 | 0.068 | 0.098 | 0.166 | 0.065 | 0.111 | 0.167 |
| Observations | 51,403 | 51,403 | 51,403 | 51,403 | 51,403 | 51,403 | 51,403 | 51,403 | 51,403 |
| Number of City-industries | 5383 | 5383 | 5383 | 5383 | 5383 | 5383 | 5383 | 5383 | 5383 |
| | Panel B: High Rent Sectors | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| lag SHARE | 1.643*** | 1.464*** | 1.565*** | -0.473** | -0.558** | -0.567** | -0.209 | -0.392* | -0.389* |
| | (0.282) | (0.372) | (0.375) | (0.228) | (0.236) | (0.235) | (0.217) | (0.237) | (0.236) |
| Controls | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| City-Industry FE | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| City Linear Year Trend | N | Y | Y | N | Y | Y | N | Y | Y |
| Industry Linear Year Trend | N | N | Y | N | N | Y | N | N | Y |
| R-squared | 0.073 | 0.114 | 0.149 | 0.054 | 0.086 | 0.152 | 0.048 | 0.090 | 0.142 |
| Observations | 38,128 | 38,128 | 38,128 | 38,128 | 38,128 | 38,128 | 38,128 | 38,128 | 38,128 |
| Number of City-industries | 3993 | 3993 | 3993 | 3993 | 3993 | 3993 | 3993 | 3993 | 3993 |

Notes: The sample covers 279 cities, 20 industries, and 12 years for 2000 - 2011. The dependent variable is the log registry capital of one type of new entry firms (connected, unconnected, or local). Controls include the lag log aggregate capital stock of the incumbent firms, log population, urbanization rate, and the output shares of the secondary industries. * Significant at 10%, ** 5%, *** 1%.

The types follow the same definitions discussed in Section 5.1. Panel A provides the estimates for the parameter $\alpha$ based on the full sample. Unsurprisingly, the share of connected firms strongly predicts the forthcoming of more connected firms in the following year, as Columns (1) to (3) reports. The preponderance of connected firms, however, appears to be negatively correlated with the entry of others. The coefficients presented in Columns (4) to (6) are all negative, and the effects are stronger and statistically more significant for the nonlocal unconnected firms than for local firms.

In Panel B of Table 6, the estimates use only the subsample of firms in high-rent sectors. The results are qualitatively similar, and now the share of connected firms has a stronger and more significant impact of deterring new entries of unconnected and local firms. The coefficients for unconnected firm is -0.567 (p=0.05) and that for local firms is -0.389 (p=0.1). In turn, one standard deviation increase in the share of connected firms at time $t-1$ translates to a reduction of entry rate by 5% for unconnected firms ($-0.567 * \times 0.087 \approx -0.049$) and a reduction by 3.4% for local firms ($-0.389 * \times 0.087 \approx -0.034$) in terms of the total registry capital. Once again, the discrepancy between the estimations obtained on the full sample and on the high-rent sectors only is suggestive that the pattern of investments moving across cities following the leaders is related to collusion.

## 5.3 Impacts on Innovation

To further evaluate on the economic consequences of connected firms, we investigate how the share of connected firms shapes innovative activities in the market. Corruption renders a high risk of predation for firms without strong political connection, undermining productive entrepreneurship and encouraging unproductive entrepreneurship in the spirit of Baumol (1990). If the share of connected firms is truly reflective of collusion, we should expect the lagged term of the share of connected firms, as defined in the last Section, to be negatively associated with the level of innovative investments. To test this hypothesis, we use the number of patents by each city-sector as a measure

of innovation and specify the estimation as follows.

$$\log \text{PAT}_{ist} = \gamma \log \text{PAT}_{is,t-1} + \alpha \text{ SHARE}_{i,t-1} + \beta X_{it} + a_{is} + \lambda_t + t \times \delta_p + t \times \mu_s + \epsilon_{it} \quad (5)$$

The dependent variable in Equation (5) is the measure of the amount of patents at the city-sector level. We control for the lagged dependent variable and a set of control variables, including the lagged term of aggregate capital stock of existing firms, the logarithm of population, the rate of urbanization, and the output share of secondary industries at the city level. The main variable of interest is $\text{SHARE}_{i,t-1}$, the capital share of connected firms among all existing firms. In addition, we control for city-sector fixed effects $a_{is}$, time fixed effects $\lambda_t$, city specific time trends $t \times \delta_p$ and sector specific time trends $t \times \mu_s$.

Column (1) of Table 7 presents the results using the total number of filed patent applications by city-sector. The coefficient of lag SHARE is -0.131 and significant at 0.05 level. An increase in one standard deviation of lag SHARE reduces the amount of patent applications. Columns (2) and (3) respectively report the estimates using the number of patent applications normalized by city population and the total registry capitals of all existing firms in that city-sector. The results remain negative and significant. In Columns (4) through (6), we adopt the number of approved patents as an alternative measure of innovation. The coefficients based on total and normalized approved patents are consistent with the results obtained from applications in Columns (1) to (3).

# 6 Accounting for Political Incentives

The results presented in the previous Sections attest to the premise that the inter-city investment flows following transferred leaders may have stemmed from collusion and rent-seeking behaviors. In particular, the analyses on firm heterogeneity show

Table 7: The Effects of Political Connections on Innovation

| Dependent Variable | log(PatApp+1) | log(PatApp/Pop+1) | log(PatApp/K+1) | log(PatGrt+1) | log(PatGrt/Pop+1) | log(PatGrt/K+1) |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| lag SHARE | -0.131** | -0.027*** | -0.034* | -0.130** | -0.017** | -0.025* |
| | (0.061) | (0.009) | (0.017) | (0.053) | (0.008) | (0.013) |
| Controls | Y | Y | Y | Y | Y | Y |
| City-Sector FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |
| City × Year Trend | Y | Y | Y | Y | Y | Y |
| Sector × Year Trend | Y | Y | Y | Y | Y | Y |
| R-squared | 0.389 | 0.376 | 0.221 | 0.385 | 0.367 | 0.203 |
| Observations | 51,403 | 51,384 | 51,403 | 51,403 | 51,384 | 51,403 |
| Number of City-industries | 5,383 | 5,383 | 5,383 | 5,383 | 5,383 | 5,383 |

Notes: The sample covers 279 cities, 20 industries, and 12 years for 2000 - 2011. The dependent variables are the log number of applied/granted patents (normalized by the population of the city or by the total registry capital of the city-industry) in a specific year, city, and industry. The main independent variable is the lag share of the registry capital of the connected firms in the city. Controls include the lag log aggregate capital stock of the incumbent firms in the city-industry, log population, urbanization rate, and the output shares of the secondary industries of the city. * Significant at 10%, ** 5%, *** 1%.

stronger effects for firms with a higher demand of collusion. In this Section, we focus on the supply side of the collusion. That is, the incentive and cost of subnational leaders to provide patronage for firms to move along with them. We echo with two lines of existing accounts on the behaviors of Chinese officials. First, subnational leaders are career-concerned, so their choice of being a moving umbrella may reflect their promotion incentives. Second, subnational leaders may collude with private interests for either rent-seeking purposes or for enhancing economic performance, so the prevalence of connected firms is shaped by the cost of collusion.

## 6.1 Interacting with Leaders' Characteristics

The first set of tests addressing political incentives replicate the baseline estimation in Equation (1), with additional inclusion of interactive terms between the transfer dummy and leaders' characteristics. We first consider whether a transferred leader from city $i$ to $j$ was originally born in city $i$, in which case we code the dummy NATIVE as 1 for the city-dyad $ij$ at time $t$. A locally born or promoted political leader had better local knowledge and lower communication cost with local interest groups. Hence it is easier for them to collude with the business in seeking private rents (Jia and Nie, 2015). As Column (1) of Table 8 reports, the interaction term between NATIVE and the transfer dummy is positive and significant. This is consistent with the existing finding in the literature that officials' local connections may aggravate collusion.

We account for leaders' tenure and age as a mediative channel of the incentive to collude with firms. 1(TENURE $\geq$ 5YR) is a dummy variable equal to 1 if the transferred leader had served in the previous jurisdiction for five years or more. A long tenure tends to be associated with stronger local networks, which increase the profitability of collusion. We also account for officials' relative chance of promotion. 1(AGE $\geq$ RL) is equal to 1 if a transferred official had reached the de facto "retirement age" due to the CPC's routine practice of age limits, that is, 63 for provincial leaders

and 58 for city leaders. If connected investment helps boost local economy, leaders with strong career-concerned motives should be more keen in becoming a moving umbrella. By contrast, if the purpose of rent-seeking precedes growth and entrepreneurship as a main cause of investment flows, as some previous tests have suggested, the effects should be more telling for leaders with weak promotion incentives.

Column (2) of Table 8 shows that a long tenure ($\geq$ 5 years) of the transferred officials in the previous jurisdiction does not induce more inter-city investments. However, as Column (3) shows, 1(AGE $\geq$ RL) has a positive and significant coefficient associated with a transferred official who attracted inter-city investments. For officials beyond the age limits, the chance of promotion is negligible, and hence rent-seeking may stand out as a main incentive. Hence, the results lean in favor of the collusion and rent-seeking hypothesis and do not show strong supports for the career-concerned explanations for the pattern of investment flows.

Table 8: Accounting for Leader Characteristics

| Dependent Variable | log(1+ FLOW) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1(TRANSFER) | 0.019 | 0.011 | 0.021** |
| | (0.012) | (0.020) | (0.011) |
| 1(TRANSFER) * 1(NATIVE) | 0.156*** | | |
| | (0.053) | | |
| 1(TRANSFER) * 1(TENURE $\geq$ 5 YR) | | 0.024 | |
| | | (0.022) | |
| 1(TRANSFER) * 1(AGE$\geq$RL) | | | 0.172** |
| | | | (0.040) |
| Controls | Y | Y | Y |
| Dyad FE | Y | Y | Y |
| Year FE | Y | Y | Y |
| R-squared | 0.067 | 0.067 | 0.066 |
| Observations | 1,047,840 | 1,047,840 | 1,047,840 |
| Number of City Dyads | 87,320 | 87,320 | 87,320 |

The sample covers 87,320 city dyads from 2000 to 2011. In all columns city-dyad and year fixed effects are included. Controls include log per capita real GDP and log population of both the origin and the destination cities. * Significant at 10%, ** 5%, *** 1%.

## 6.2 Political Turnovers and Corruption Investigations

The final set of tests confront the two potential explanations for investment flows (rent-seeking versus career-concern) with the data of career turnovers of subnational leaders. Note that whether a leader is transferred to a different jurisdiction at some point in his or her career may be endogenous, hence, assessments on the impacts of connected firms with transferred leaders may not generalize to the sample of officials who did not experience any transfer through their careers. Due to the lack of proper counter-factual, it is infeasible to estimate the effect of thus connected firms on the turnover of non-movers. Keeping this caveat in mind, we come up with a tentative test on the effect of connected firms among all leaders who had been transferred at least once during the sample period.[11] First, we estimate the effect of the scale of collusion, as measured by the capital share of connected firms among all firms operated locally, on the promotion of transferred leaders in a similar fashion as in Li and Zhou (2005). The specification is as the following.

$$\begin{aligned}
&\Pr[\text{TURNOVER}_{ir} = 0] = \Lambda(\alpha_1 - X\beta), \\
&\Pr[\text{TURNOVER}_{ir} = 1] = \Lambda(\alpha_2 - X\beta) - \Lambda(\alpha_1 - X\beta), \\
&\Pr[\text{TURNOVER}_{ir} = 2] = 1 - \Lambda(\alpha_2 - X\beta)
\end{aligned} \tag{6}$$

with

$$X\beta = \beta_0 \text{ SHARE}_{ir} + \beta_1 \log(\text{CAPITAL}_{ir} + 1) + X_{ir}\beta_2 + \delta_{ir}$$

Equation (6) estimate the relationship between connected firms and promotion with ordered Probit models. The dependent variable TURNOVER is a categorical variable of three values: 0 for the termination of a leader's tenure, 1 for any position remaining at the same rank, and 2 for promotion to another position with higher rank. We separately code the turnover of leaders for each leader $i$ at the end of term $r$. $\Lambda(\cdot)$

[11] Among all subnational leaders, the movers were both more likely to be promoted and more likely to be prosecuted for corruption than non-movers. We relegate the tests comparing movers and non-movers in the appendix.

specifies the cumulative logistic distribution function, with $\alpha_1$ and $\alpha_2$ being two cut-off values to be estimated. The main variable of interest is SHARE, the capital share of connected firms among all newly registered firms during the term $r$. To address the possibility that the prevalence of connected investments may be correlated with leaders' effort of investment facilitation across all cities, we also control for $\log(\text{CAPITAL}_{ir}+1)$, the scale of all registry capitals during leader $i$'s term $r$. In addition, $\delta_{ir}$ stand for a set of dummy variables characterizing leader and provincial features. We then proceed to estimate the effect of connected firms on the probability of a transferred leader being prosecuted for corruption. The model is specified as follows.

$$\Pr[\text{CAUGHT}_i = 1] = \Lambda[\beta_0\ \text{SHARE}_i + \beta_1\ \log(\text{CAPITAL}_i + 1) + X_i\beta + \delta_i], \qquad (7)$$

In estimation (7), each observation is a political leader who had been transferred at least once through the sample period. The dependent variable, $\text{CAUGHT}_i$, is a dummy indicating whether the leader was caught and prosecuted for corruption as of the end of 2016. $\Lambda(\cdot)$ is the cumulative logistic distribution function. Similarly as in Equation (6), SHARE stands for the ratio of connected registry capitals and $\log(\text{CAPITAL}_i + 1)$ is the total amount of registry capitals throughout the leader's tenure in the sample period. $\delta_i$ represents a set of dummies reflecting provincial and leader features.

As Columns (1) to (3) of Table 9 report, more connected investments from one's previous jurisdiction does not help the promotion for transferred leaders. Indeed, the coefficients are negative notwithstanding the lack of statistical significance. In Columns (4) through (6), the estimates for corruption prosecution suggest that the coefficients for SHARE are all positive and significant at the conventional level. The results are robust when we include various dummies related to leaders' age, rank, the number of previous transfers, as well as interactive terms of personal traits. Meanwhile, the total amount of registry capital does not matter for promotion or corruption prosecution.

Table 9: Impacts on Officials' Career Outcomes

| Dependent Variable | TURNOVER | | | CAUGHT | | |
|---|---|---|---|---|---|---|
| | Ordered Logistic | | | Logistic | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| SHARE | -0.024 | -0.025 | -0.023 | 0.068* | 0.073** | 0.065* |
| | (0.055) | (0.059) | (0.059) | (0.040) | (0.037) | (0.036) |
| Lag. log (CAPITAL +1) | | 0.002 | 0.002 | | 0.004 | 0.006 |
| | | (0.003) | (0.003) | | (0.005) | (0.006) |
| Constant cut1 | -3.816** | -5.069*** | -2.739 | | | |
| | (1.533) | (1.854) | (2.463) | | | |
| Constant cut2 | 0.007 | -1.239 | 1.113 | | | |
| | (1.513) | (1.828) | (2.445) | | | |
| Controls | N | Y | Y | Y | Y | Y |
| Province FE | Y | Y | Y | NA | NA | NA |
| YEAR FE | Y | Y | Y | NA | NA | NA |
| Ranking FE | Y | Y | Y | N | Y | Y |
| Ranking × AGE FE | N | N | Y | N | N | N |
| Age Cohort FE | NA | NA | NA | Y | Y | Y |
| Transfer Mode FE | NA | NA | NA | Y | Y | Y |
| Transfer Mode × Ranking FE | NA | NA | NA | N | Y | Y |
| Log Pseudo-likelihood | -584.6 | -581.9 | -581.6 | -161.5 | -152.3 | -151.9 |
| Pseudo R2 | 0.038 | 0.042 | 0.042 | 0.025 | 0.056 | 0.059 |
| Observations | 712 | 712 | 712 | 469 | 469 | 469 |

Notes: Results in Panel A and B are obtained using the official and official-term data set, respectively. The official ranking dummies in Panel A refer to dummies for the highest ranking throughout the official's career, while those in Panel B refer to the official's current ranking for the term. The transfer pattern dummies indicate how many inter-province and intra-province transfers the official has experienced in his career. The year dummies in Panel B are dummies for the starting year of the term. * Significant at 10%, ** 5%, *** 1%.

The differentiated effects of inter-city investments reported by Tables 8 and 9 are consistent with a separating equilibrium of bureaucrats with different incentives: the officials with strong promotion incentives may be more precautious and disciplined, while those with weaker promotion incentives and stronger local connections are more likely to collude with the business. Consequently, officials with little hope of promotion spend more efforts on rent-seeking. This makes them more vulnerable to corruption investigation than non-colluders.

# 7 Conclusion

The collusion between politicians and private interests is ubiquitous in developing countries. While collusion benefits connected parties, it often involves a misallocation of productive resources and hence is bad for economic growth. This paper provides a novel empirical strategy for identifying the link between powerful bureaucrats and their patronage over private investments. By tracing the direction of leader transfer among different cities in China, we estimate a robust increase in inter-city investments within the same directed city-dyad right after the leader transfers. In addition, the paper documents a set of features of such investments that are consistent with theoretical predictions of collusion and rent-seeking models. The investments following transferred leaders are found to (1) concentrate in high-rent sectors; (2) have a higher survival rate when the leaders remain in office but much lower survival rate once the leaders are gone; (3) be negatively associated with new entries into the market; (4) undermine the level of innovation in subsequent years; (5) are most sizeable when the transferred leaders have low promotion incentives and more local connections; (6) increase the likelihood of corruption prosecution for the transferred leaders.

Analyzing connected investments through leader transfers provides a new method for studying economic impacts of collusion and corruption. *Ex ante*, it is difficult to measure the scale of corruption. The *ex post* measures based on scandals and prosecutions often reflect the exposure to anti-corruption forces, not the prevalence of

corruption itself. Even when *ex ante* and *ex post* measures are aligned, the level of corruption may be endogenously affected by local conditions correlated with economic growth. Exploring leader transfers helps alleviate the endogeneity problem because it is hard for a newly moved leaders to establish collusion with local businesses within a short period of time. Thus, connected inter-city investments following leader transfers reveal part of the iceberg of the existing collusion and rent-seeking. Such an empirical strategy would be useful for studying corruption and rent-seeking in other systems where political agents are regularly rotated by a third party.

The findings shed lights on how incentives shape the relationship between the state and the market. It is well-established that the CPC uses performance evaluation and personnel control to boost economic performance (Xu, 2011). Bureaucrats, however, are both career-motivated and rent-seeking. The system still comes with collusion, and investments induced by political connections tend to be distortive and unsustainable. Collusion imposes a social cost by undermining productive entrepreneurship (Baumol, 1990; Murphy et al., 1991). In response, the government bites the bullet to purge corrupted officials.

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# Appendix

Table A1: Inter-province Transfers

| Dependent Variable | log(1+ FLOW) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| 1(TRANSFER) | 0.136** | 0.145** | 0.140** |
| | (0.059) | (0.058) | (0.058) |
| Controls | N | Y | Y |
| Dyad FE | Y | Y | Y |
| Year FE | Y | Y | Y |
| Region-Time Trends | N | N | Y |
| R-squared | 0.225 | 0.230 | 0.235 |
| Observations | 11160 | 11160 | 11160 |
| Number of Province Dyads | 930 | 930 | 930 |

The sample covers 930 province dyads from 2000 to 2011. In all columns province-dyad and year fixed effects are included. Controls include log per capita real GDP and log population of both the origin and the destination provinces. * Significant at 10%, ** 5%, *** 1%.